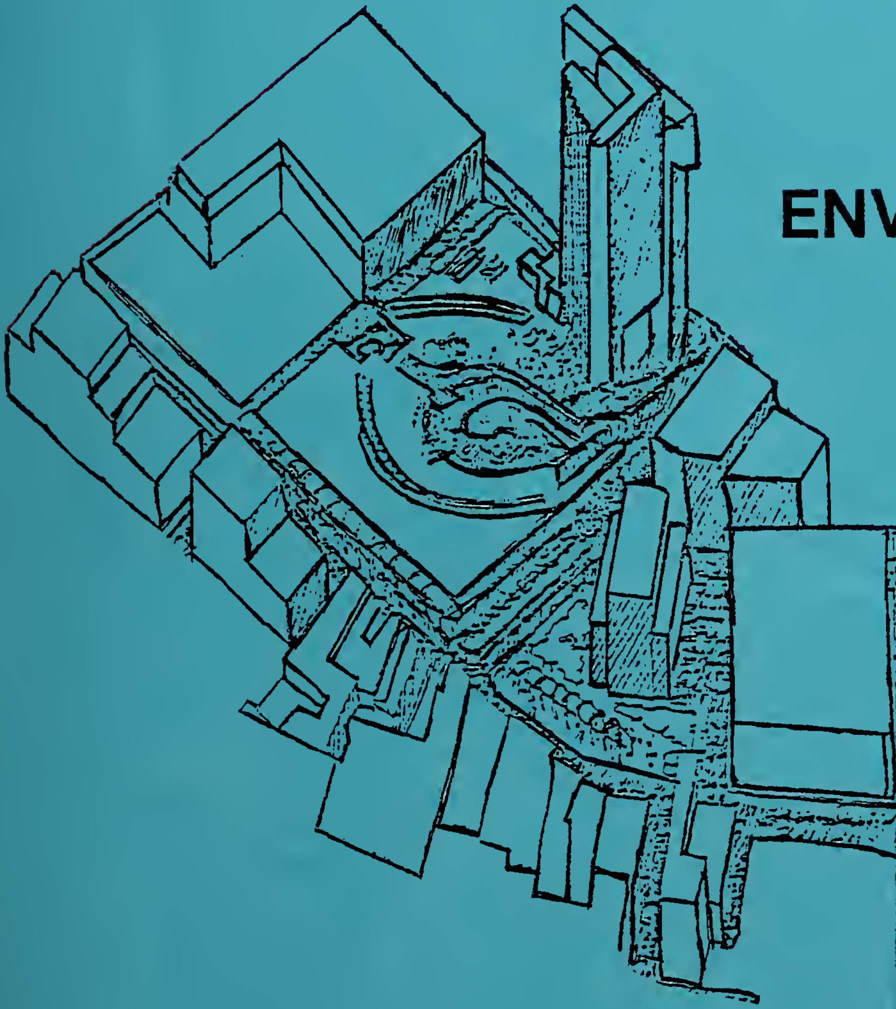
GOVDOC
BRA
5187
DRAFT

BOSTON PUBLIC LIBRARY
3 9999 06543 495 1

LAFAYETTE PLACE

~~Property Of
BOSTON REDEVELOPMENT AUTHORITY
Library~~



DRAFT ENVIRONMENTAL IMPACT STATEMENT

BOSTON
PUBLIC
LIBRARY

JULY 1978

CITY OF BOSTON /
BOSTON REDEVELOPMENT AUTHORITY

Downtown
XING
B65R
1978

HUD (CDBG)-R01-EIS-78-1D
Section 104h of the
Housing and Community Development Act of 1974, as amended
(Urban Development Action Grant Program)

LAFAYETTE PLACE

Draft Environmental Impact Statement

City of Boston
Office of Federal Compliance
Boston City Hall
1 City Hall Plaza, Room 960
Boston, Massachusetts 02201

Date: JUL 21 1978

Prepared by:

Boston Redevelopment Authority
Environmental Review Section
Boston City Hall
1 City Hall Plaza
Boston, Massachusetts 02201

Digitized by the Internet Archive
in 2012 with funding from
Boston Public Library

http://www.archive.org/details/lafayetteplacedrft00bost

TABLE OF CONTENTS

Page No.

INTRODUCTION vii

PROJECT SUMMARY 1

Part I DESCRIPTION OF THE PROJECT 5

A. Type of Action 5
B. Project Description 5
C. Description of the Project Area 23
D. Purpose and Objectives of the Project 24
E. Project History and Status 26
F. Project Funding 27
G. Conformance With Official Plans 29
H. Public Reaction to the Project 30

Part II DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS AND PROBABLE IMPACT OF THE PROJECT 33

A. Physical Environment 33

1. Land Use and Physical Characteristics 33
2. Land Conditions 51
3. Natural Resources and Climatic Conditions 59
4. Transportation Network 63
5. Infrastructure and Energy Resources 109
6. Air Quality 129
7. Noise Levels 157
8. Water Quality 179
9. Wind and Shadow Effects 183

B. Socio-Economic Environment 185

1. Character of the Community 185
2. Community Facilities and Services 203
3. Relocation 211
4. Economic Analysis 213
5. Municipal Resources 223

C. Aesthecic Environment 231

1. General Aesthetic Character 231
2. Historical and Archaeological Resources 235

Part III ALTERNATIVES TO THE PROPOSED PROJECT 241

A. Alternative Sites 241
B. Alternative Uses 241

TABLE OF CONTENTS

Page No.

Part III ALTERNATIVES TO THE PROPOSED PROJECT (cont)
C. Alternative Development Proposals 243

1. No-Build Alternative 243
2. Development Proposal of a Larger Size 246
3. Development Proposal With Alternative Use 255
4. Development Alternative of a Smaller Size 256

D. Alternative Proposals for the Hayward Place Garage 257

Part IV ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED AND MEASURES TO MINIMIZE ADVERSE IMPACTS 259

A. Short-Term Impacts and Mitigation Measures 259
B. Long-Term Impacts and Mitigation Measures 268

Part V RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY 275

Part VI IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES 277

APPENDICES

A. Bibliography
B. Bedford-West Urban Renewal Plan Excerpts
C. State and Regional A-95 Comments
D. Logs of Test Borings and Soil Profiles
E. Boston Transit and Traffic Improvement Program
F. Parking Demand and Traffic Generation Calculations
G. Estimation of Daily Water and Sewage Demand
H. Estimation of Construction Debris
I. Massachusetts Energy Code
J. Air Quality Meteorological and Monitoring Equipment Specifications
K. Air Quality Impact Analysis
L. Parking Freeze Application and Permit
M. VMT Analysis
N. Downtown Boston Noise Survey
O. Lafayette Place Noise Survey Analysis and Worksheets
P. Evaluation of Noise Levels According to Traffic Characteristics
Q. Boston Harbor Water Quality Survey - Excerpts
R. Solid Waste Generation Estimates
S. Letter from State Archaeologist
T. Section 106 Historic Preservation Determination
U. Comments of Boston Landmarks Commission
V. Boston and Massachusetts Air and Noise Pollution Regulation - Excerpts
W. Massachusetts Environmental Notification Form

LIST OF TABLES

Table No. Page No.

I.1 Project Activity Schedule 10
I.2 Lafayette Place Project - Source of Funds 28

II.A.1 Lafayette Place - Existing Land Use 36
II.A.2 Lafayette Place - Existing Ownership 38
II.A.3 Estimated 1974 Average Daily Traffic Volumes - Regional Expressway Access to Downtown Boston 66
II.A.4 Existing Traffic Volumes - Lafayette Place Project Vicinity 72
II.A.5 Approximate 24-Hour 1-Way MBTA Station Volumes Near Lafayette Place Project Area 73
II.A.6 Carrying Capacity of MBTA Transit System 74
II.A.7 Potential Percentage of 1980 Project Peak Hour MBTA Passenger Volumes to Carrying Capacity 79
II.A.8 Existing Parking Space Supply (Parking Garages Only) 84
II.A.9 Peak Hour Traffic Generated by the Proposed Lafayette Place Development 93
II.A.10 Site Generated Traffic Volume by Direction of Approach/Exit - Peak-Hour Periods 94
II.A.11 Analysis of Traffic Volume Changes as a Result of TTIP Project - Lafayette Place Project Vicinity 95
II.A.12 Intersection Analysis - TTIP and Lafayette Place Generated Traffic 101
II.A.13 Lafayette Place - Preliminary Energy Consumption Demands 125
II.A.14 Massachusetts and Federal Ambient Air Quality Standards 130
II.A.15 Summary of the Revised Metropolitan Boston Transportation Control Plan 132
II.A.16 Summary of Pollutant Emissions in the Metropolitan Boston APCD (1973) 134
II.A.17 Ambient Air Measurements - Boston Air Monitoring Stations 135
II.A.18 Results of CO Monitoring Program - Lafayette Place Project Site 141
II.A.19 Emission Factors for Heavy Duty Vehicles and Construction Equipment 145
II.A.20 Predicted (1982) Maximum 1-Hour and 8-Hour Carbon Monoxide Concentrations at Selected Receptor Locations 149
II.A.21 Garage Ventilation Parameters 154
II.A.22 Effects of Garage Emissions on Ambient Carbon Monoxide Levels in the Project Area 155
II.A.23 Estimates of Magnitudes of Noise Effects 160
II.A.24 Lafayette Place Ambient Noise Measurement Survey 162
II.A.25 Noisiest Equipment Types Operating at Construction Sites 165
II.A.26 Usage Factors of Equipment in Non-Residential Construction 168
II.A.27 Typical Ranges of Noise Levels at Construction Sites With a 70 dB(A) Ambient Typical of Urban Areas 171

LIST OF TABLES

Table No.		Page No.
II.A.28	Exposure of Building Occupants to the Noise of Building Equipment	172
II.A.29	Projected L_{eq} Noise Levels Resulting from TTIP Plan and Lafayette Place Project	178
II.B.1	A Summary of Retail Sales Trends in the CBD and Metropolitan Market from 1948-1972, With Projections for 1985	187
II.B.2	CBD Retail Sales	188
II.B.3.a	CBD Sales Projections by Market Segment	194
II.B.3.b	Percent Distribution of CBD Sales by Market Segment	194
II.B.4	Lafayette Place Project - Anticipated Employment Opportunities	198
II.B.5	Crime Statistics, 1977 - City of Boston Police Department	204
II.B.6	Economic Impact of the Lafayette Place Development - Summary Table	216
II.B.7	Estimated Values of Existing Lafayette Place Parcels	223
II.B.8	City of Boston Revenues from Lafayette Place Site in 1977	224
II.B.9	Total Public Investment by Year	226
II.B.10	Annual Debt Service for Lafayette Place Project by Year	227
II.B.11	Annual City Revenues upon Completion of Project by Year of Start	228
II.B.12	Annual City Net Revenues upon Completion of Lafayette Place Project	229
III.1	Lafayette Place - Comparative Economic Benefits Original Proposal vs. Current Proposal	254
IV.1	Immediate Abatement Potential of Construction Equipment	262
IV.2	Noise Control for Construction Equipment	263
IV.3	Result of Noise Mufflers and Acoustical Enclosures on Construction Equipment and Tools Now in Use	264

LIST OF FIGURES

Figure No.		Page No.
I.1	Lafayette Place - Regional Location	6
I.2	City of Boston Urban Renewal Projects	7
I.3	Lafayette Place Project Location	8
I.4	Proposed Site Plan	11
I.5	Lafayette Place 3-Dimensional Perspective Including Adjacent Streets	12
I.6	Cross-Section of Proposed Lafayette Place Project (East-West)	13
I.7.a	Lafayette Place - Plan at Level 1	14
I.7.b	Lafayette Place - Plan at Level 2	15
I.7.c	Lafayette Place - Plan at Level 3	16
I.7.d	Lafayette Place - Plan at Level 25	17
I.8.a	View of Lafayette Place Model - Washington Street Elevation	18
I.8.b	View of Lafayette Place Model - New Arterial Elevation	19
I.8.c	View of Lafayette Place Model - Hotel Tower	20
I.8.d	View of Lafayette Place Model - Aerial View of Retail Center	21
I.8.e	View of Lafayette Place Model - Detail of Retail Center Mall	22
II.A.1	Project Area Parcels	34
II.A.2	Existing Land Use	35
II.A.3	Land Ownership Within Project Area	39
II.A.4	Property Acquisition	40
II.A.5	Existing Zoning	42
II.A.6	CBD - Functional Areas	43
II.A.7	Building Conditions	45
II.A.8	Outline of Original Boston Peninsula and Filled Land (1795-1895)	52
II.A.9	Geologic Map of the Boston Basin	53
II.A.10.a	Number of Peak Person Trips by Mode	64
II.A.10.b	Percent of Peak Person Trips by Mode	64
II.A.11	Highway and Rapid Transit Access	65
II.A.12	1977 Highway Network Inside Route 128	67
II.A.13	Comparison 1954, 1964, 1972 and 1974 Accumulation of Vehicles Entering and Leaving Study Area	69
II.A.14	Existing Traffic Flow Directions and P.M. Peak-Hour Volumes (4:30-5:30)	70
II.A.15	1977 Rapid Transit Network	75
II.A.16	1977 Commuter Rail Network	80
II.A.17	Pedestrian Volumes, Weekday - Noon, September 1973	82
II.A.18	Boston Transit and Traffic Improvement Program	86
II.A.19	Traffic Influence Areas	88
II.A.20	Direction of Traffic Approach	90
II.A.21	Modal Split of Shoppers and Employees	91
II.A.22	Proposed Street Realignments	98
II.A.23	P.M. Peak (4:30-5:30) Lafayette Place Garage and TTIP Volumes, June 1, 1978	100
II.A.24	Metropolitan Boston Water Supply System (MDC)	110
II.A.25	City of Boston Southern Low Service Water Distribution Service	112
II.A.26	City of Boston, Southern High Service Water Distribution Service	113

LIST OF FIGURES

Figure No.		Page No.
II.A.27	Lafayette Place, Water Systems - High and Low (Existing)	114
II.A.28	City of Boston High Pressure Fire Service	115
II.A.29	Lafayette Place, High Pressure Fire Service (Existing)	116
II.A.30	North Metropolitan Sewer System (MDC)	118
II.A.31	Lafayette Place, Sanitary and Storm Sewer Systems (Existing)	119
II.A.32	Proposed Additions to MDC Water Supply System for Metropolitan Boston	123
II.A.33	Massachusetts Air Pollution Control Districts	133
II.A.34	Location of CO Probes and Meteorological Equipment - Lafayette Place Ambient Air Quality Survey	140
II.A.35	Receptor Sites - Lafayette Place Air Quality Impact Analysis	147
II.A.36	Common Indoor and Outdoor Noise Levels	158
II.A.37	Expected Community Response Versus dB(A) Level Increase Over Existing Ambient	159
II.A.38	Ambient Noise Level Monitoring Program (P.M. Peak-Hour = 4:30-5:30)	163
II.A.39	Construction Equipment Noise Ranges	166
II.A.40	Provisional Criteria Relating NPL to Community Noise Acdeptability	169
II.A.41	Range of Building Equipment Noise Levels to Which People are Exposed	173
II.A.42	Cross-Section of a Typical Multi-Story Building Showing Building Equipment	174
II.A.43	Projected Noise Levels from Implementation of TTIP Plan and Lafayette Place Development	177
II.C.1	Historic and Architecturally Significant Properties	236
III.1	View of Model of Original Proposal for the Lafayette Place Development Project	247

INTRODUCTION

This Environmental Impact Statement has been prepared pursuant to CEQ and HUD guidelines for the preparation of environmental impact statements and pursuant to HUD regulations respecting environmental review responsibilities for projects funded under the Community Development Block Grant Program of the Housing and Community Development Act of 1974, as amended. At the present time, the proposed Lafayette Place development project is only in schematic design, and although the principal components of the project have been established, design details are subject to change as a result of further development of the plan. Therefore, this EIS necessarily is limited in its level of detail of the evaluation of environmental impacts by the currently available information and development status of the project plans. Nonetheless, this environmental assessment has been undertaken at this time in compliance with CEQ guidelines which direct that the NEPA process be integrated in the planning process at the earliest possible time to insure that planning and decisions reflect environmental values and in order that potential adverse environmental effects may be avoided or minimized through project modification.

In addition, this Statement is being filed with the Massachusetts Executive Office of Environmental Affairs, pursuant to the Massachusetts Environmental Policy Act, General Laws, Chapter 30, Section 61 and 62 to 62H, inclusive. A copy of the Massachusetts Environmental Notification Form is attached as Appendix W.

SUMMARY SHEET

Status:

(X) Draft ( ) Final Environmental Impact Statement

Subject:

Lafayette Place
Boston, Massachusetts
Urban Development Action Grant Program

Responsible Agency:

City of Boston
Office of Federal Compliance
Boston, Massachusetts
(acting for U.S. Department of Housing and Urban Development,
Boston Area Office, pursuant to Section 104 h of the Housing and
Community Development Act of 1974, as amended)

Name of Action:

(X) Administrative ( ) Legislative

Brief Description of Action:

The proposed Lafayette Place development project represents a $71.8 million public and private investment program in the center of downtown Boston and encompasses a major retail/hotel complex, a new City garage, and ancillary public improvements. The project area, extending generally from Washington Street to Chauncy and Essex Streets and from Avon Street to Hayward Place and Exeter Place, encompasses approximately 6 acres of predominantly vacant land. The program's goals is to rejuvenate the retail area along Washington Street and foster round-the-clock activity in the core of downtown Boston.

Key components of the Lafayette Place project include a 300,000 square feet retail center, a 500-room hotel tower, 1,500 parking spaces provided by a new 900 car underground garage and rehabilitation of an existing garage on the site for 600 spaces, construction of a new east-west arterial street, and related project and other street improvements.

A Federal grant in the amount of $8,000,000 has been requested from the U.S. Department of Housing and Urban Development, under the Urban Development Action Grant Program, to assist in the implementation of the Lafayette Place development.

Summary of Environmental Impact and Adverse Environmental Effects

The Lafayette Place project is designed to take advantage of an opportunity to continue and expand the revitalization of the retail core of Boston, and to strengthen its role as the central business district of the entire metropolitan area. Implementation of the proposed project, therefore, is expected to result in significant beneficial impacts for the City, including the removal of existing blighting and other adverse conditions on and adjacent to the project area, the economic renewal of the retail core, the strengthening of the City's tax base, the improvement of investment confidence, the arrest of continued deterioration in the area, and increased potential for redevelopment and rehabilitation in the ganeral vicinity.

The principal adverse impacts of the project will occur during the construction period and will include increased air pollution and noise levels, the generation of solid waste and debris, temporary disruption of vehicular and pedestrian traffic, minor increases in water pollution potential, increased safety hazards, and the disturbance of ground water levels. Long-term negative impacts will be limited to increased vehicular traffic in the area, an increase in air pollution and noise levels, additional burdens on utility systems and energy resources, and potential effects on the adjacent Chinatown area. Mitigation measures are available and will be employed to minimize or avoid any adverse impact from the project.

Alternatives Considered:

Alternatives considered include a "No-Build" option, development alternatives of lesser and greater scales, and a development proposal with alternative uses. Consideration was also given to alternative sites for the project and alternative uses for the project site.

Federal, State, and Local Agencies from which Comments Have Been Requested:

Federal

Environmental Protection Agency
Council on Environmental Quality
Advisory Council on Historic Preservation
Department of Housing and Urban Development (informational only)
Department of Commerce
Department of the Interior
Department of Health, Education, and Welfare
Department of Labor
Department of Transportation
Energy Resource and Development Administration
Federal Aviation Administration
Federal Highway Administration
Community Services Administration

State

Executive Office of Environmental Affairs
Office of State Planning and Management
Metropolitan Area Planning Council
Massachusetts Historical Commission
Department of Community Affairs
Department of Commerce and Development
Department of Environmental Quality Engineering
Department of Public Works
Massachusetts Bay Transportation Authority
Attorney General

Local

Mayor's Office
Boston City Council
Boston Redevelopment Authority
Boston Conservation Commission
Boston Air Pollution Control Commission
Boston Landmarks Commission

Date Statement Made Available to EPA and Public

Draft: JUL 21 1978
Final:

PART I DESCRIPTION OF THE PROJECT

Part I DESCRIPTION OF THE PROJECT

A. Type of Action

Under Section 119 of Title I of the Housing and Community Development Act of 1974, as amended (the Urban Development Action Grant Program), the City of Boston has made an application to the U. S. Department of Housing and Urban Development for Federal financial assistance, in the amount of $8,000,000, for the purpose of assisting the development of the Lafayette Place retail complex/hotel/parking project in Downtown Boston. The Lafayette Place project is the second component of a major revitalization effort in the retail core of the City of Boston, the first component, completed in 1977, involving $35 million of private investment consolidating and rebuilding the Jordan Marsh department store facility. The project includes, within its boundaries, the redevelopment of the Bedford-West Urban Renewal Project (Mass. R-182), previously funded under Title I of the Housing Act of 1949, as amended. This project has been completed, with the exception of land disposition and the construction of project improvements in the surrounding streets, which activities will be incorporated into the Lafayette Place project.

B. Project Description

The proposed Lafayette Place development project represents a $71.8 million public and private investment program in the center of downtown Boston and encompasses a major retail/hotel complex, a new City garage, and ancillary public improvements. The total project area, extending generally from Washington Street to Chauncy Street and to Kingston Street and from Avon Street to Hayward, Exeter, and Rowe Places and Essex Street, contains approximately 6.0 acres of predominantly vacant property. Redevelopment will take place over a four year period and will continue the redevelopment activities initiated by the reconstruction and consolidation by Jordan Marsh Company, Boston's oldest and largest retail store, of its downtown department store.

The diversity of uses proposed for the project is intended to foster round-the-clock activity and represents a concerted effort to extend the life of Boston's retail core. The development program's goal is to integrate Lafayette Place into Downtown Boston. The retail components are intended to rejuvenate the retail area along Washington Street by providing a high quality shopping environment of speciality shops and boutiques directly linked to the Jordan Marsh store. An active retail frontage on Washington Street is expected to provide continuity and interest in the pedestrian environment as well as provide a major incentive to the overall improvement of the surrounding area.

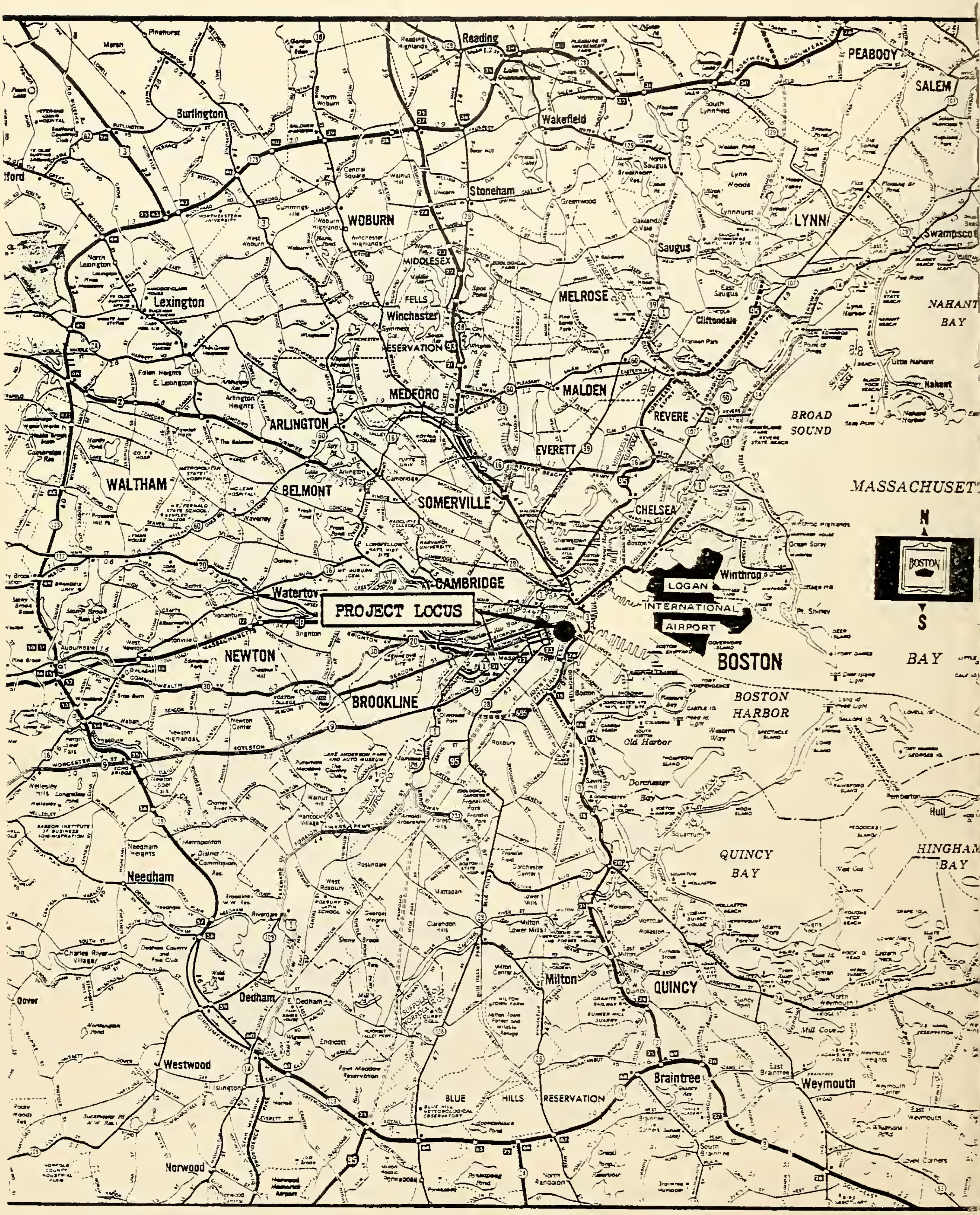


Figure I.1: LAFAYETTE PLACE - REGIONAL LOCATION

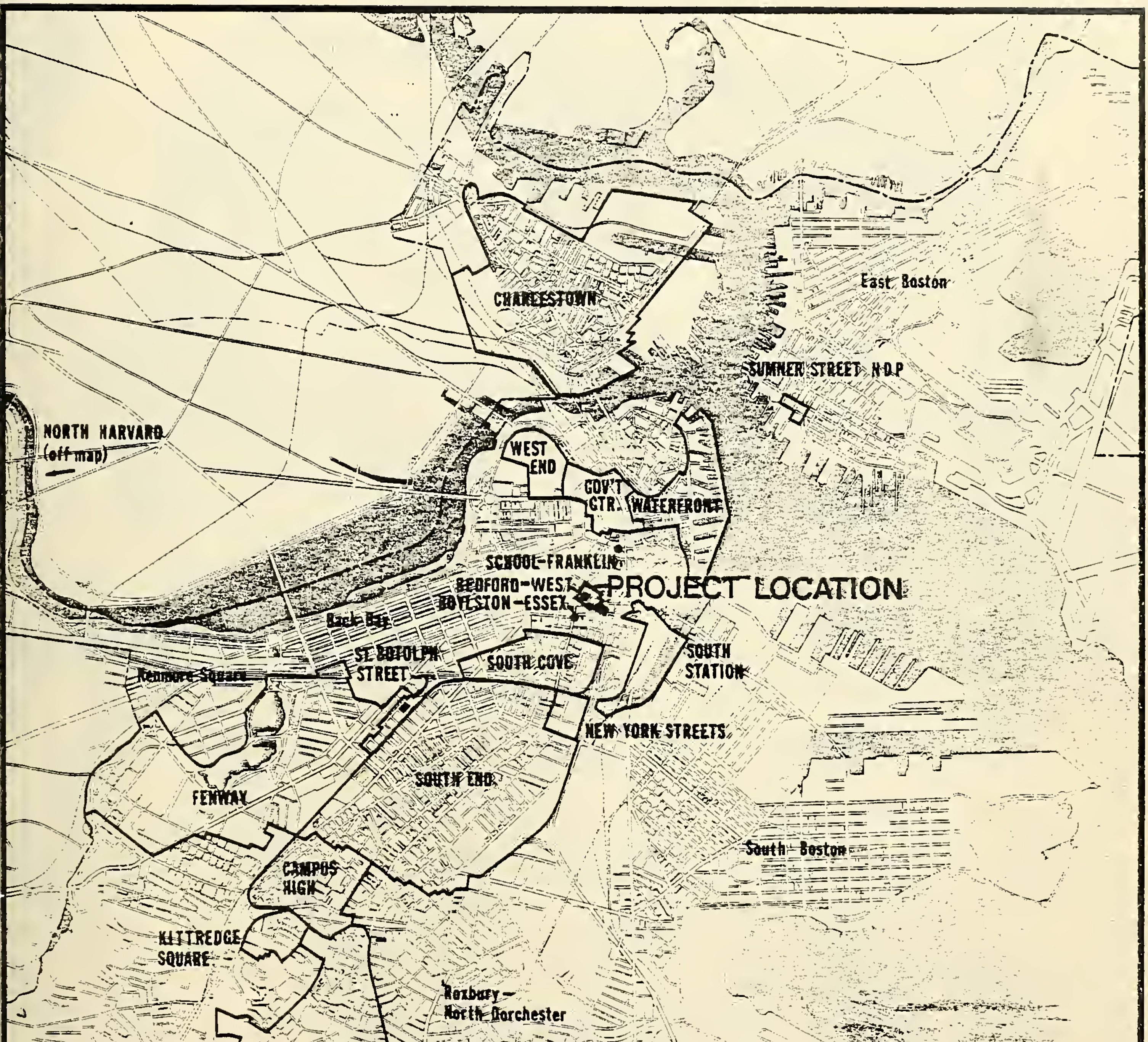
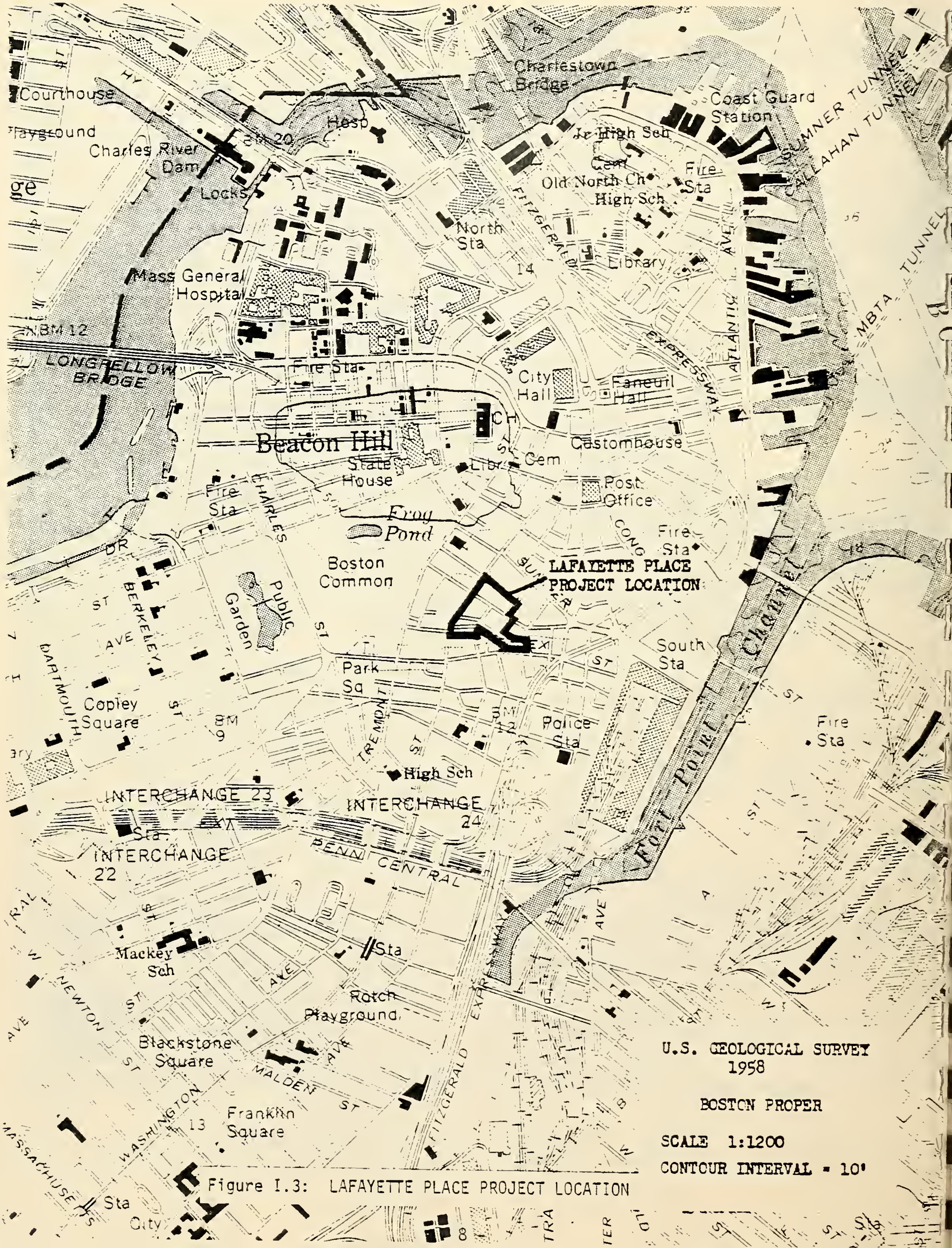


Figure I.2: CITY OF BOSTON URBAN RENEWAL PROJECTS



U.S. GEOLOGICAL SURVEY
1958

BOSTON PROPER

SCALE 1:1200

CONTOUR INTERVAL = 10'

Figure I.3: LAFAYETTE PLACE PROJECT LOCATION

In addition, the project has been designed to feature generous internal pedestrian spaces and dramatic visual interaction among the project elements. The proposed massing and setback of higher elements should help relate the project to its surroundings. Approximately one million square feet of space are proposed to be developed under current plans. The resultant floor area ratio is compatible with the density of the Central Business District and is permissible under existing zoning regulations.

Key components of the Lafayette Place project include the following:

1. A 300,000 square foot retail center containing primarily specialty shops and international boutiques. The retail center will front on Washington Street and will directly connect to the adjacent Jordan Marsh department store. Three stories in height, the major feature of the center will be a large circular public space in the middle of the building, about 100 feet in diameter, open to the sky and landscaped. Large and small stores will line the interior space at the street level and on the second floor. The concept of the mall is to combine the sophisticated flavor of European marketing with the practical design of an urban shopping center, offering a wide range of goods at prices to appeal to shoppers of all income levels. Several cinemas would be located on the third level of the center. Total net leasable area will be approximately 200,000 square feet. Major entrances to the retail center will be located on Washington Street at Avon Street (which will be discontinued under the plan) and at Jordan Marsh.

2. A 500-room high quality hotel tower approximately 42 stories in height. The hotel will be built above the retail center on Chauncy Street and will directly overlook the circular public space. The hotel lobby is planned to connect to the center. Some 30 floors of hotel rooms will have excellent views of the project, the Boston Common and downtown area, and the City itself. The 24-hour activity of the hotel is intended to add vitality to the entire development.

3. 1,500 parking spaces to be provided by the City of Boston. A 900-car underground garage in three levels will be built beneath the retail center and hotel complex, its roof forming the platform for "air rights" construction of the new buildings. The remaining 600 spaces will be provided by minimal renovation of the existing Hayward Place mechanical garage. Existing parking lots in front of the Hayward Place garage will be converted into a plaza-like setting.

4. Construction of a new street. A new east-west arterial street is proposed to facilitate the movement of vehicles to and from the project area and to provide better access to the garages. This street will provide three lanes westbound from Kingston Street to Washington Street and will replace the function of existing Bedford Street, which will be discontinued under the proposed project.

5. Project and other street improvements. Accompanying the new arterial street construction will be a widening of Chauncy Street to improve traffic flows and a series of pedestrian-related improvements - sidewalk widening, street facelifting, landscaped plazas - intented to create an environment free from the negative aspects of automobile noise and congestion presently experienced in the downtown area.

6. Construction of a public interior pedestrianway linking the two shopping levels of Lafayette Place to the Jordan Marsh retail store and to the Washington Street subway station. Vertical connections, in the form of escalators and elevators, will provide interconnection between these two levels and with the underground parking garage. In addition, the existing underground loading dock of Jordan Marsh will be extended and enlarged to provide an adequate service area for the Lafayette Place center.

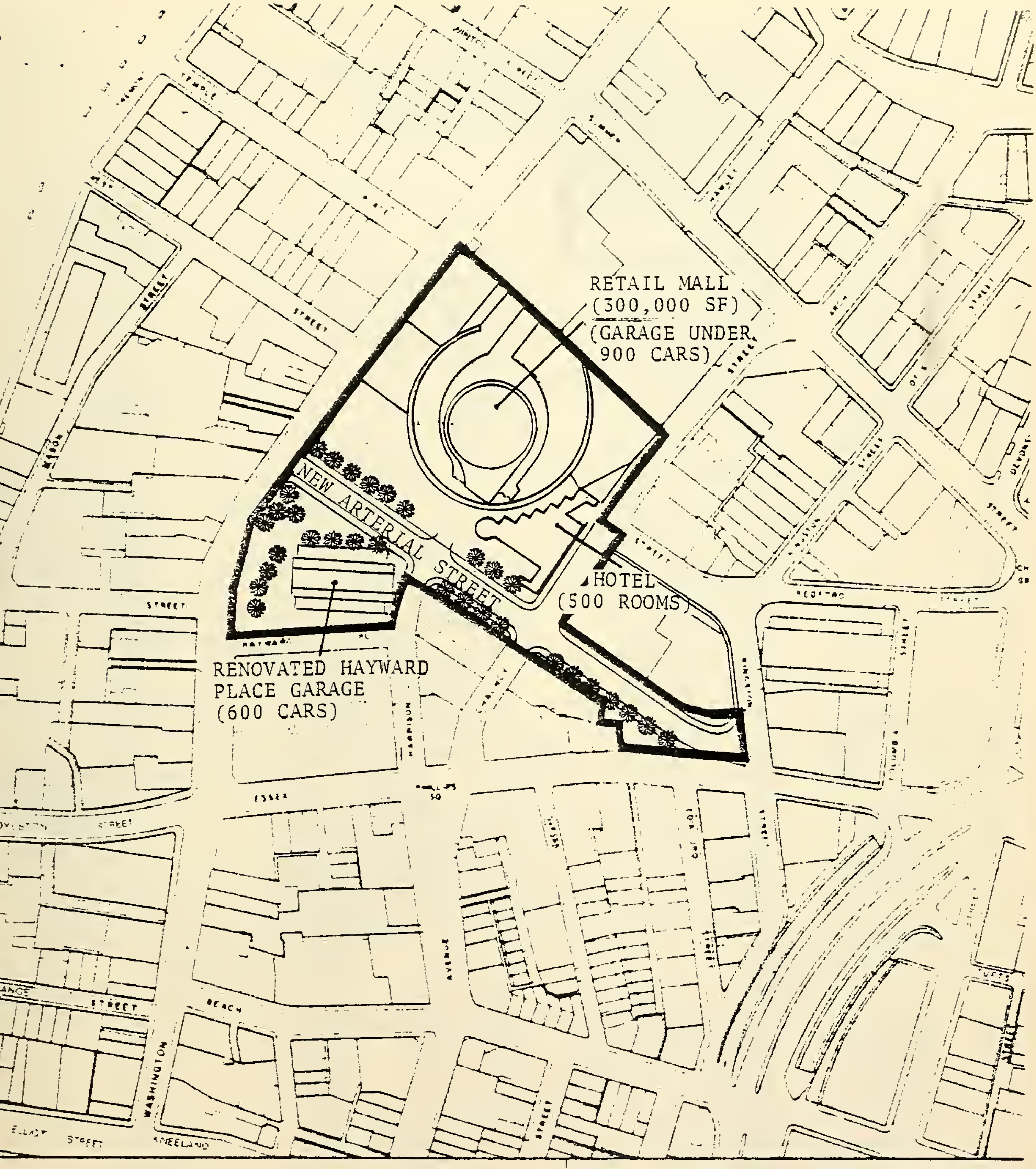
Figures 1.4 to 1.8.e illustrate the current plans and designs of the complex as well as show views of the project model.

The Lafayette Place development project is estimated to require a total investment of some $71,814,000, of which $30,564,000 includes public investment and $41,250,000 private investment (for the construction of the retail center and hotel). The private portion of the project will be a joint venture of SEFRIUS Corp. of New York and Mondev International of Montreal, Quebec. The public investment will be shared by the City of Boston, the City's Real Property Department, and the Boston Redevelopment Authority. The tentative schedule of project activities follows:

Table 1.1

Project Activity Schedule

Activity	Starting Date	Completion Date
Acquisition of remaining project property	August 1978	November 1978
Acquire leasehold interest in Hayward Place garage	October 1978	November 1978
Demolition and site clearance	August 1978	February 1979
Final design for new garage construction & old garage rehabilitation	June 1978	February 1979
Construction of new garage and rehabilitation of old garage	January 1979	January 1980
Project improvements construction	November 1978	July 1981
New-arterial construction	May 1980	September 1980
Developer support system construction	January 1980	March 1980
Retail Construction	March 1980	March 1982
Hotel Construction	March 1980	March 1982



LAFAYETTE PLACE

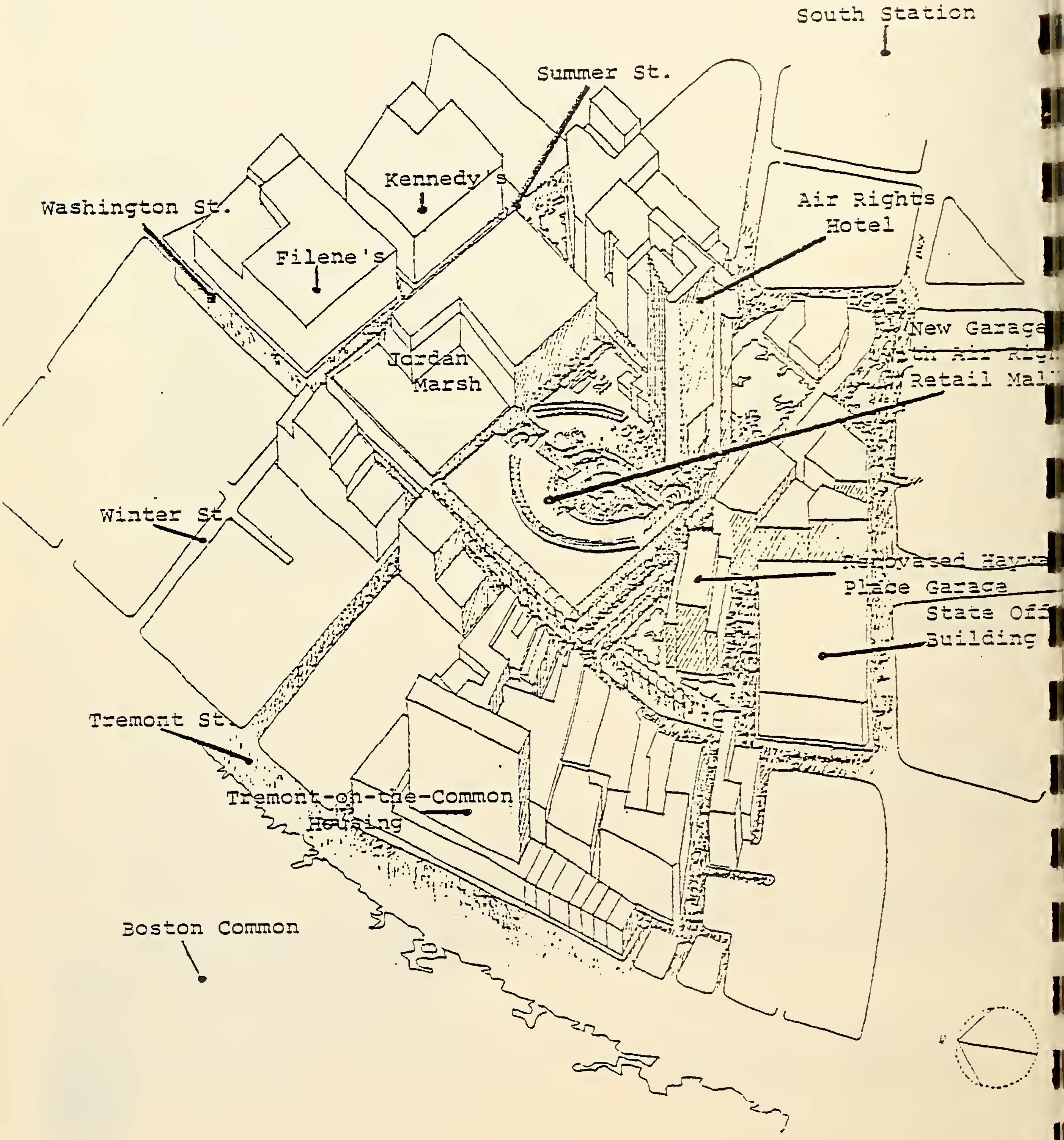
PROPOSED SITE PLAN

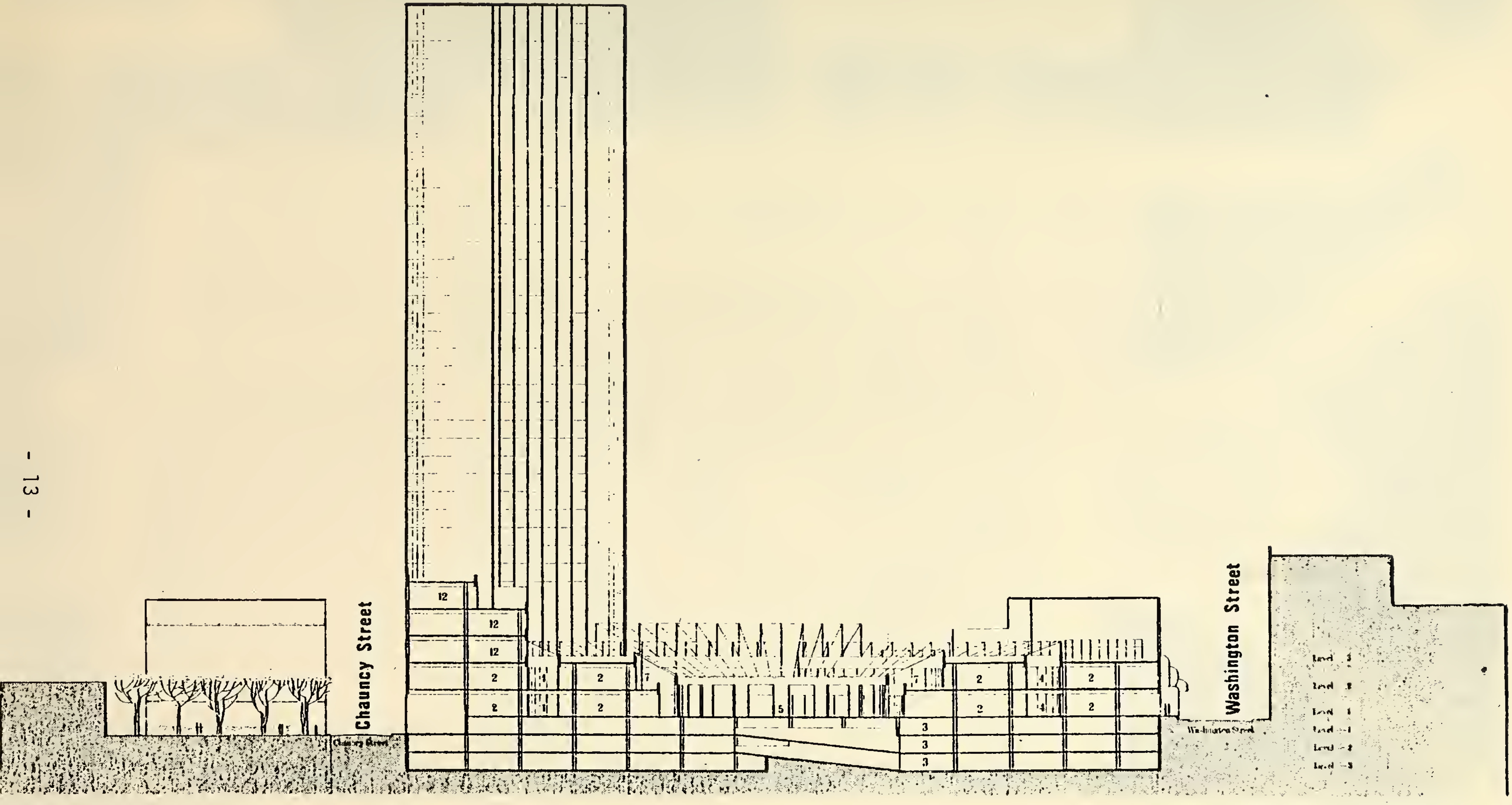
Figure I.4

BOSTON REDEVELOPMENT AUTHORITY

Figure I.5

Lafayette Place 3-Dimensional Perspective Including Adjacent Streets





2	RETAIL	5	COURT
3	PARKING	7	TERRACE
4	PASSAGE	12	HOTEL

Mondev USA, Inc.	August 1977
SEFRIUS Corporation	Owner
Mitchell/Giurgola	Architect

Figure I.6: CROSS-SECTION OF PROPOSED LAFAYETTE PLACE PROJECT (EAST-WEST)

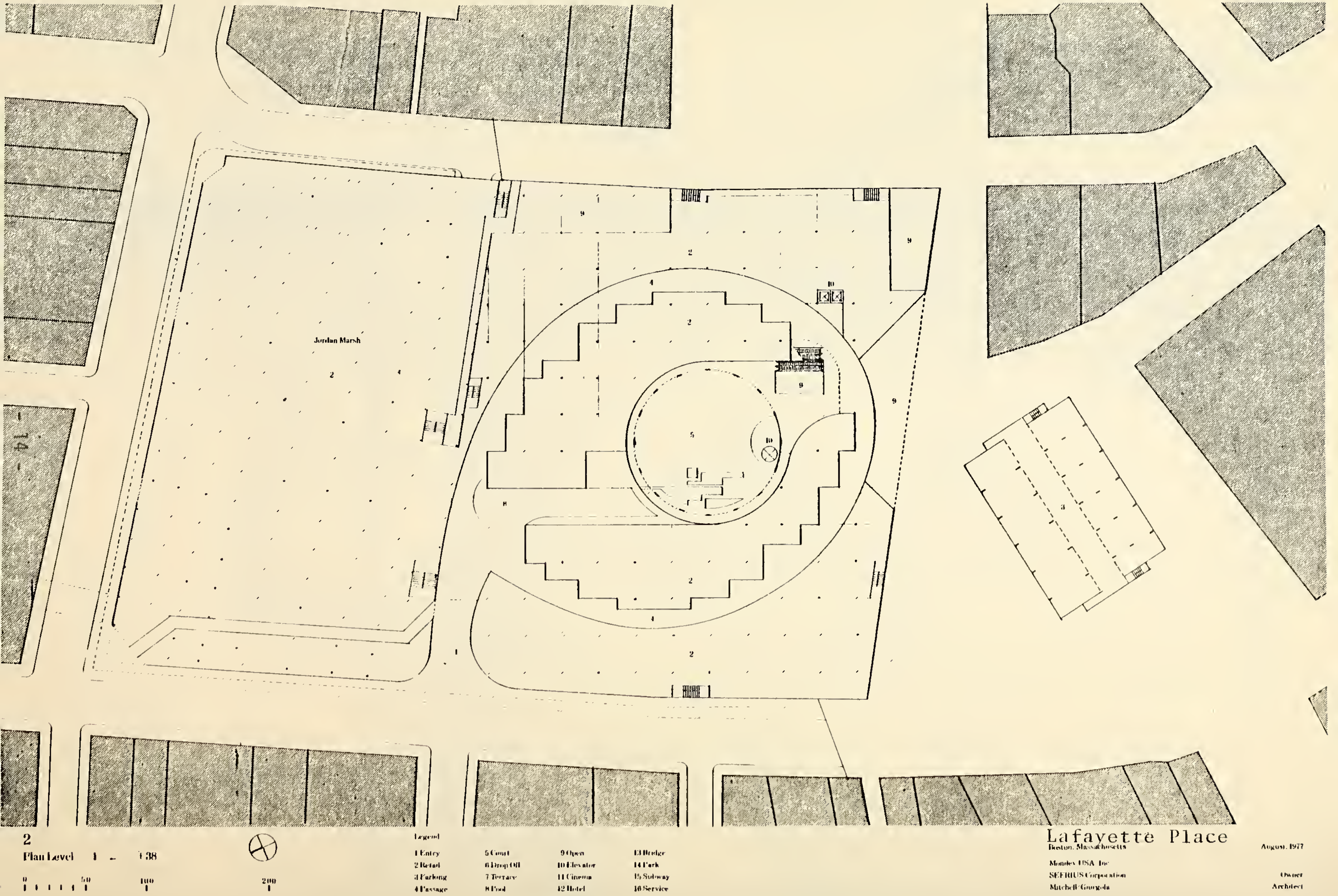


Figure I.7.a: LAFAYETTE PLACE - PLAN AT LEVEL 1

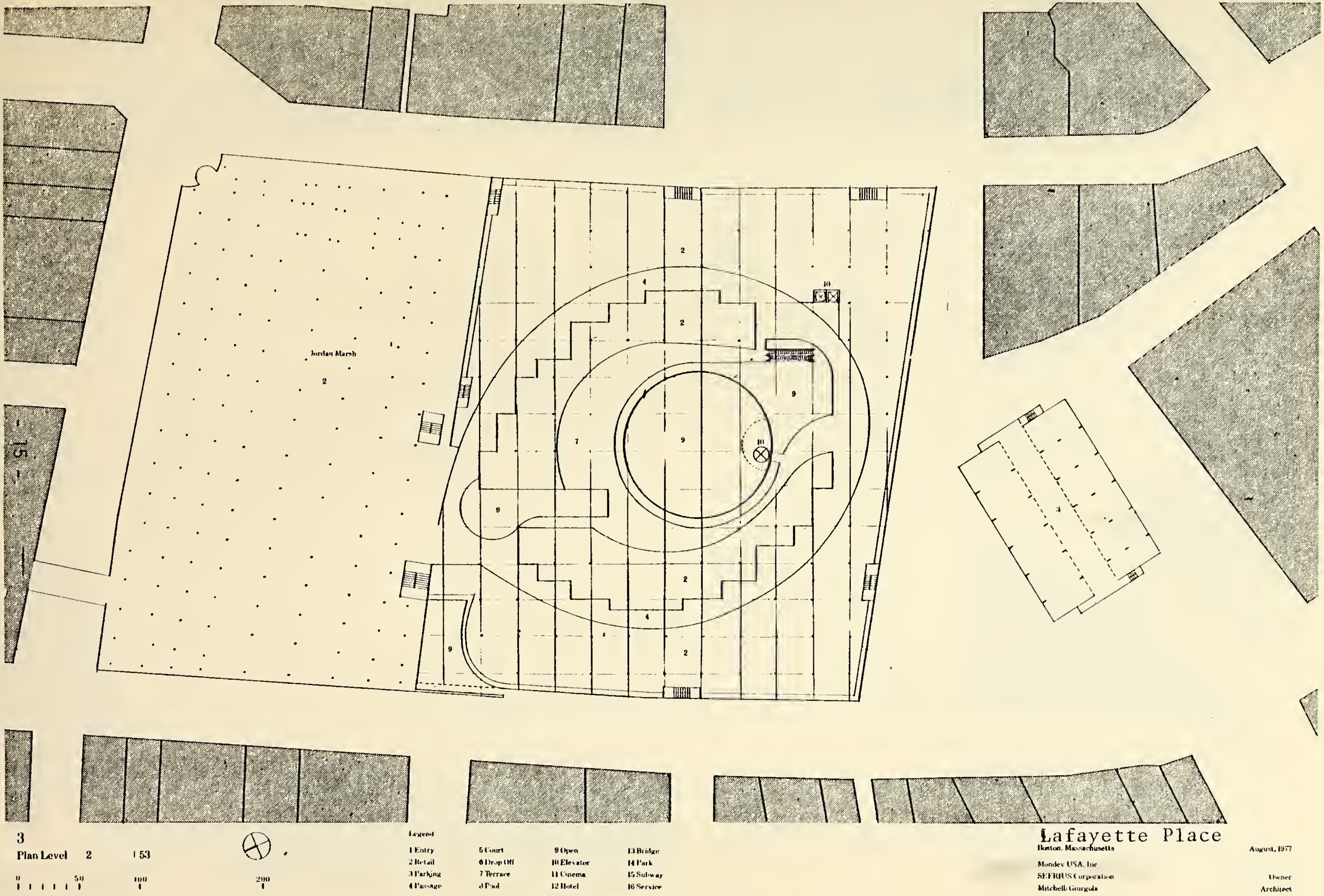


Figure I.7.b: LAFAYETTE PLACE - PLAN AT LEVEL 2

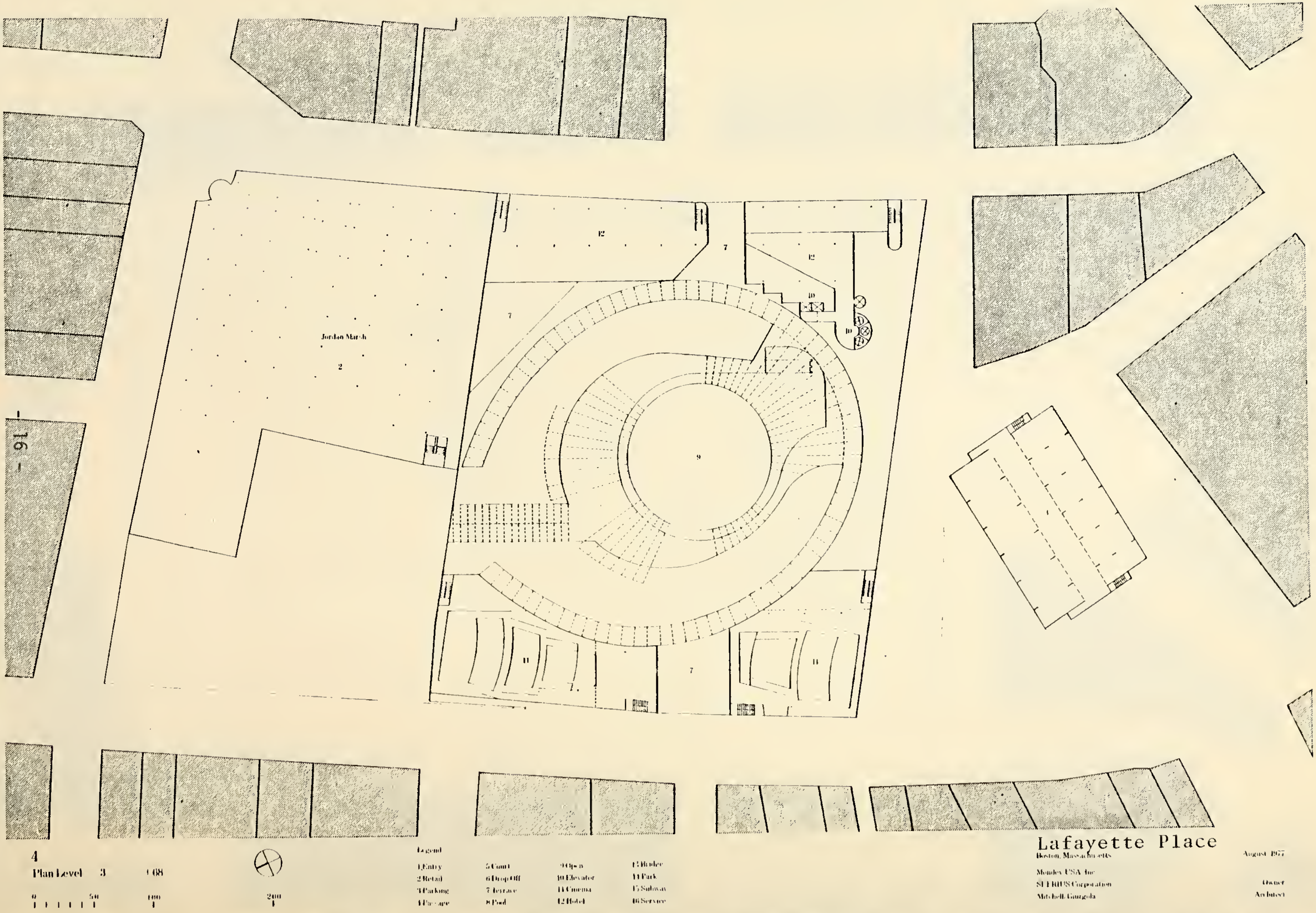


Figure I.7.c: LAFAYETTE PLACE - PLAN AT LEVEL 3

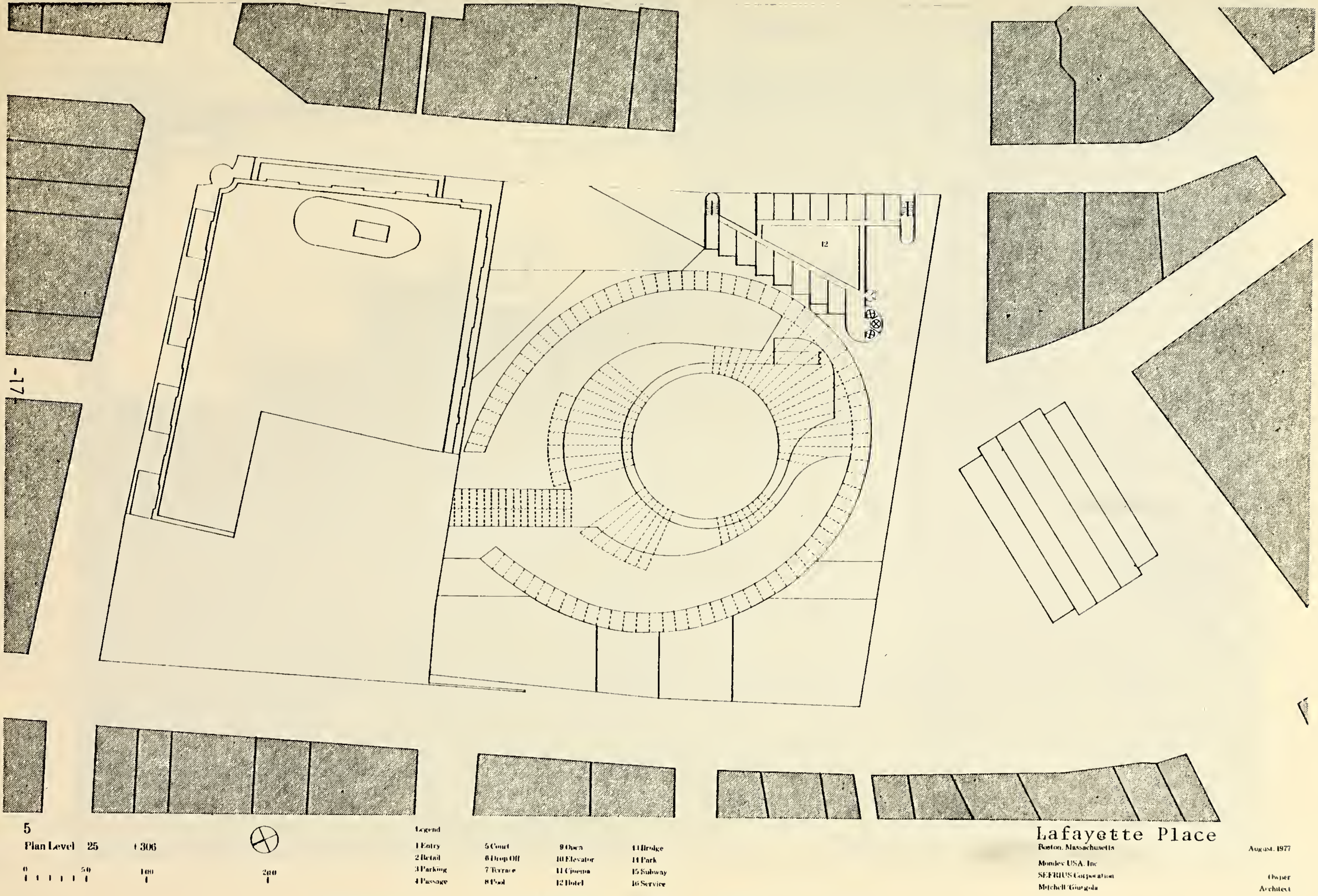


Figure I.7.d: LAFAYETTE PLACE - PLAN AT LEVEL 25

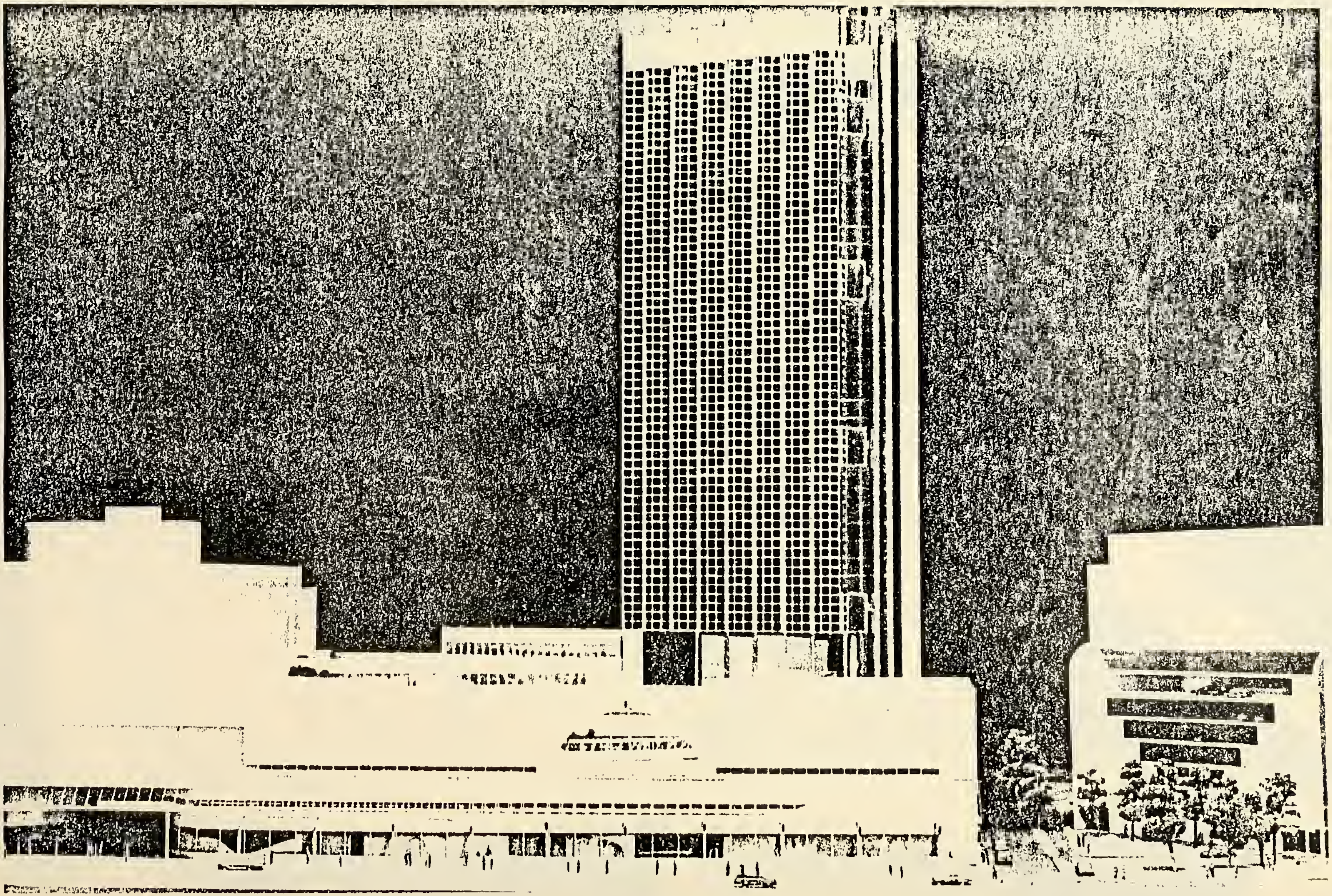


Figure I.8.a: VIEW OF LAFAYETTE PLACE MODEL - WASHINGTON STREET ELEVATION

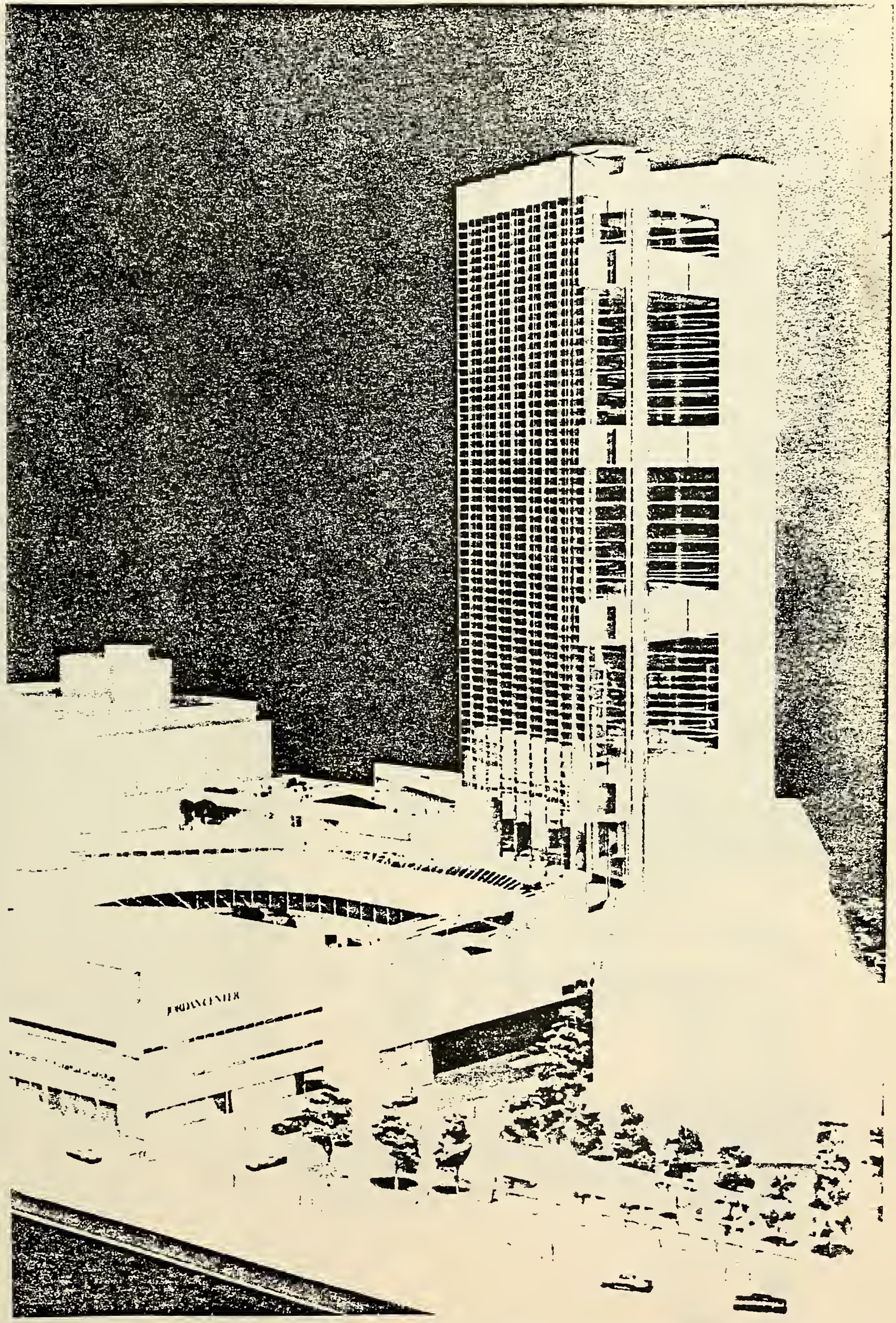


Figure I.8.b: VIEW OF LAFAYETTE PLACE MODEL - NEW ARTERIAL ELEVATION

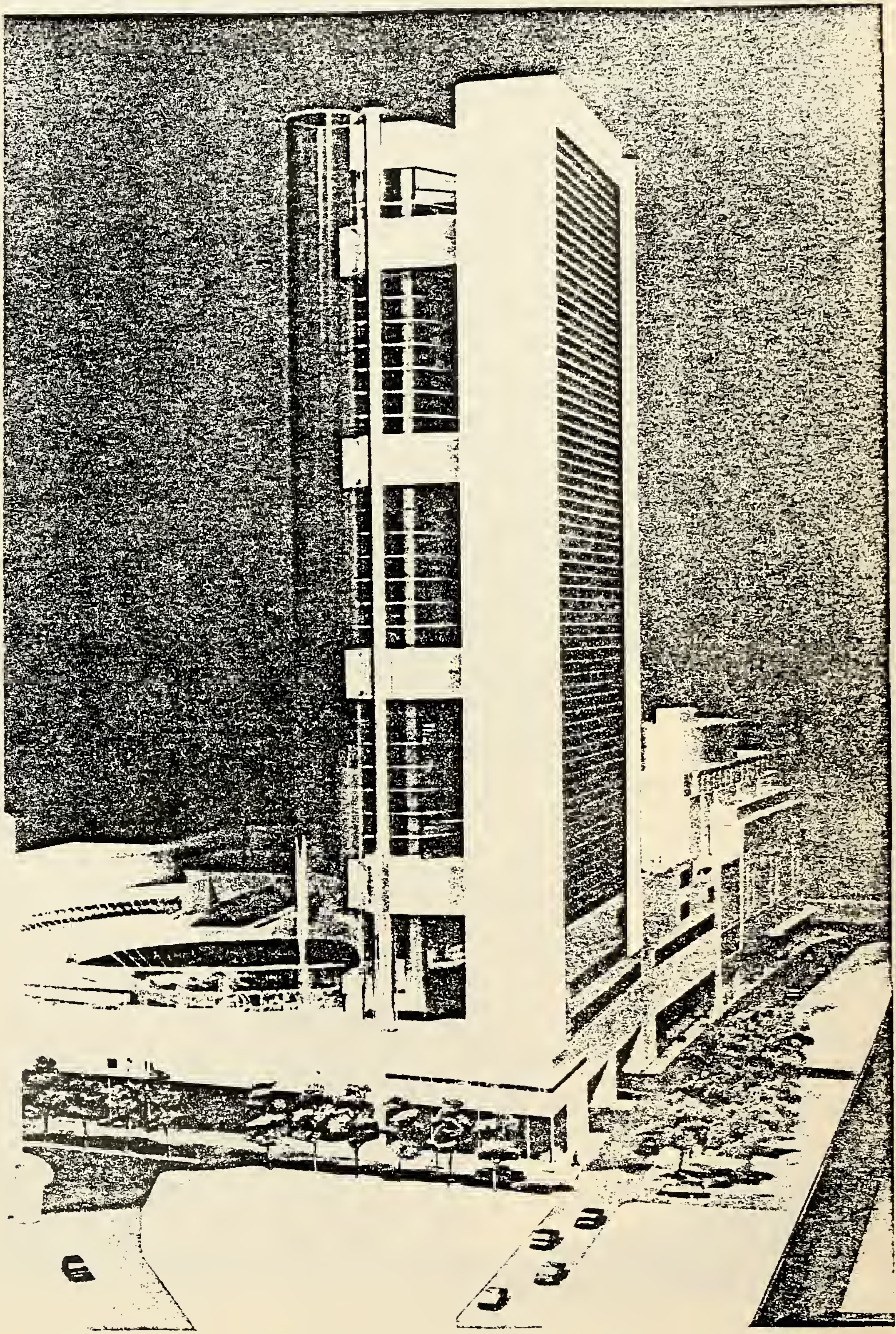


Figure I.8.c: VIEW OF LAFAYETTE PLACE MODEL - HOTEL TOWER

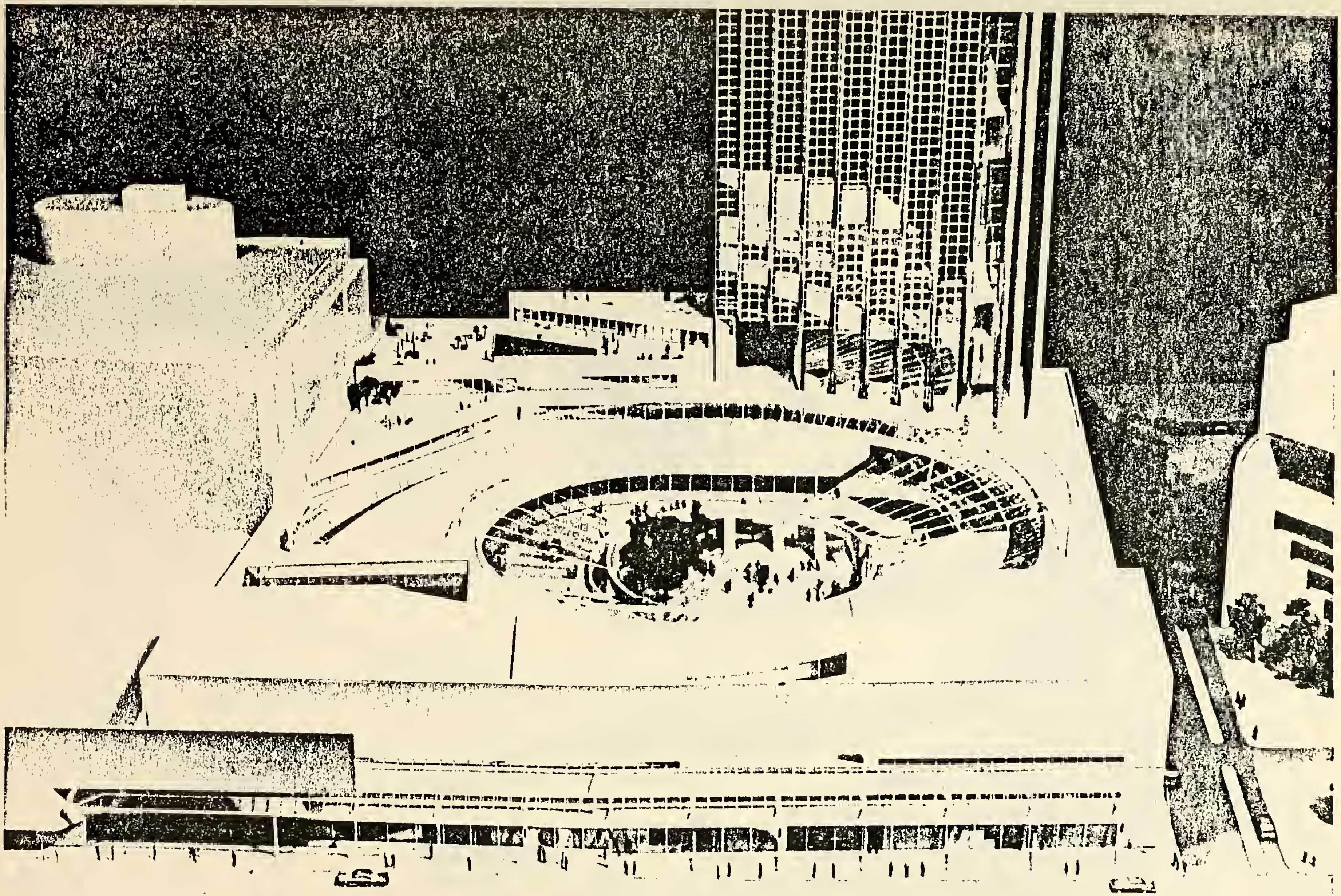


Figure I.8.d: VIEW OF LAFAYETTE PLACE MODEL - AERIAL VIEW OF RETAIL CENTER

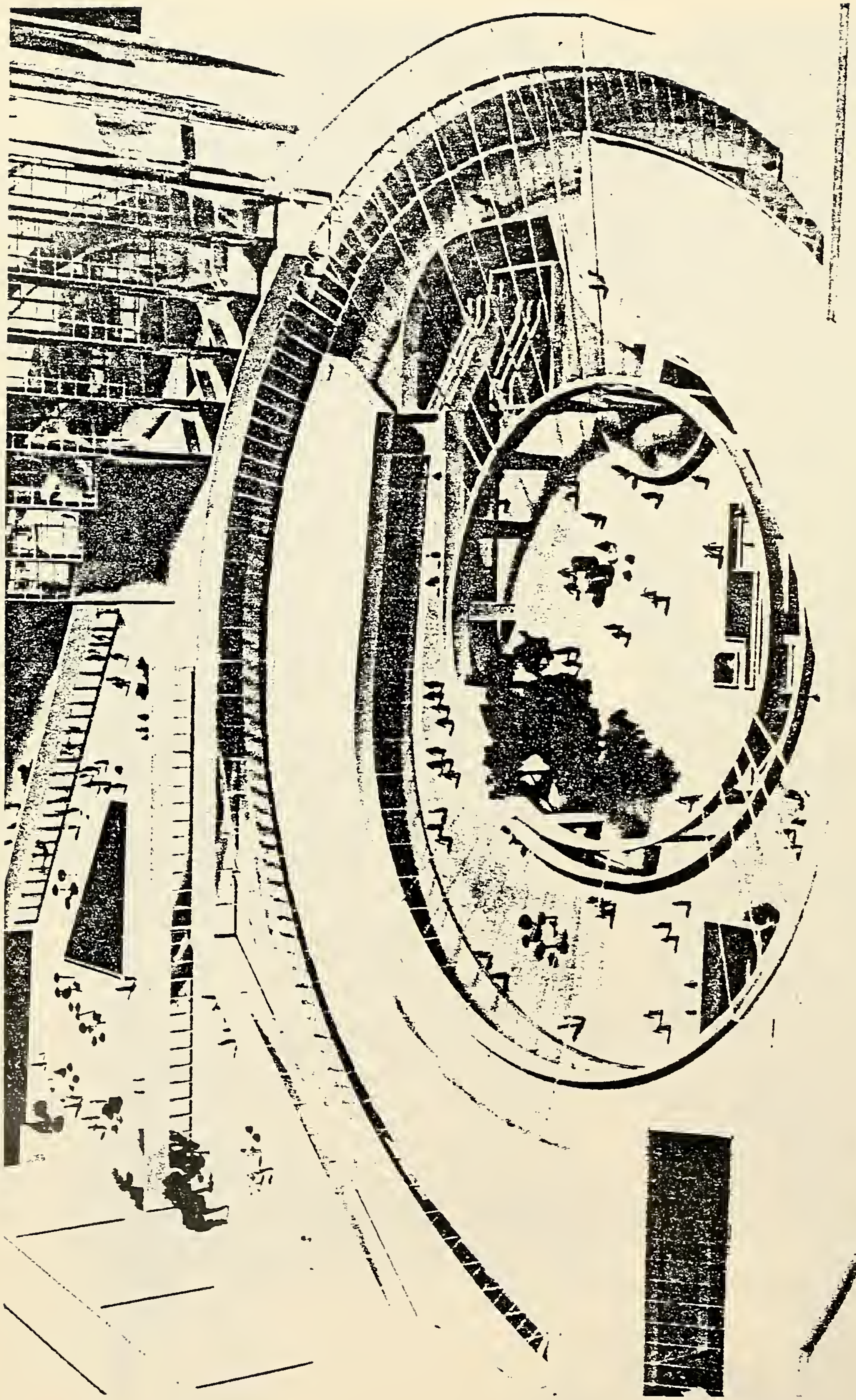


Figure I.8.e: VIEW OF LAFAYETTE PLACE MODEL - DETAIL OF RETAIL CENTER MALL

At some future date, depending on conditions of economic feasibility, the Lafayette Place development may be expanded on adjacent parcels to include additional retail and commercial space and/or office space which could be tied into the present proposal. The project's developer will have an option to acquire the vacant portion and air rights of the Edison property at Bedford and Kingston Streets and may propose further development on this site if conditions warrent. Secondly, some consideration is being given to the future demolition of the Hayward Place mechanical garage and the extension of the Lafayette Place shopping complex on its site, to further strengthen the Lower Washington Street linkage to Park Plaza and the Back Bay (for more detailed discussion of this possibility, see Part III: Alternatives to the Proposed Project. Further studies of the site will be required before any decision can be made. Should an expansion of the project subsequently be proposed, additional environmental studies will be undertaken in compliance with applicable regulations.

C. Description of the Project Area

The Lafayette Place development site is located in the commercial core of downtown Boston, one block from the 100% retail corner at Washington and Summer Streets. The office buildings at Government Center and the Financial District are a few blocks to the north and northeast. The South Station area to the east is being redeveloped as a major transportation center with concurrent office and commercial development. Retail activity borders the project area on the north, west, and south, ranging from major department stores to the small stores and specialty shops near Tremont Street to the bookstores, nightclubs, and lounges in the City's adult entertainment zone. Chinatown's commercial and entertainment area, and a small garment industry district, lie to the southeast.

The project site consists of some 6.0 acres of land and is bounded generally by Washington Street, Hayward, Exeter and Rowe Places, Essex Street, the Boston Edison Kingston Street substation, Chauncy Street, and Avon Street. Although now underutilized, the project area once was a high density commercial area, with retail activity, wholesaling, and light manufacturing the predominant uses. Today the site is largely occupied by surface parking lots and garages, and vacant commercial buildings.

In general, the surrounding area is intensely developed, with moderately high density. Most of the parcels are fully built up. Building heights are generally 5-7 stories with a few buildings reaching as high as 10-11 stories. The area is zoned for General Business, with a floor area ratio (FAR) of 10; however, existing FAR in the general area averages from 4 to 7.

For the most part, the buildings surrounding the project site date after the Great Fire of 1872 to pre-1940. The area between Summer and Essex Streets derives its character from its many late 19th century mercantile buildings of similar height and street setback but with a variety of textures and styles. Here also are found some very recent buildings, such as the Charlestown Savings Bank building and the new Jordan Marsh addition. The cross streets between Washington and Tremont Streets preserve the atmosphere of the earlier 19th century Boston, while the buildings of Chinatown, south of Essex Street, reflect the traditional mixture of manufacturing, commercial and residential uses, where early 20th century brick loft-type structures mix with three to four story residential buildings in the Late Greek revival style. Along lower Washington Street are several of the downtown theatres and movie houses.

Many of the pre-1900 buildings have badly deteriorated and are poorly maintained. Since 1946, the major economic change in this area has been the decline of manufacturing activity, and the half-empty buildings along Essex Street and Harrison Avenue offer testimony to the loss of the garment industry, for one. Buildings to the north and west of the project area are generally in better condition than those to the east and south, which tend to have lower valuation and higher vacancy.

The project site is easily accessible by public transportation and car. Two stations on the MBTA Orange and Red Lines adjoin the site, and two stations on the Green Line are a short walk away. Access to and from the Central Artery and the Massachusetts Turnpike is nearby, and arterial streets such as Washington, Boylston, and Harrison lead to and from the project area. Access from the South Station area will be provided by the proposed new arterial.

D. Purpose and Objectives of the Project

The Lafayette Place project is conceived as offering a unique opportunity for the City of Boston to revitalize its core retail district. The project can enable the recapturing of retail sales volume depleted over past decades and has the potential for returning significant positive impact on the local economy. In addition, the proposed development affords the City the opportunity to create a high quality development while generating a significant number of permanent jobs for low income and minority City residents.

The shift in the City's economy from manufacturing to services meant a loss of nearly 25,000 manufacturing jobs and a decline of 5,000 jobs in retail and wholesale trade from 1960 to 1970. Although these losses were more than offset by increases in service occupations, they indicate a serious dislocation of the work force, with the consequent deterioration and demolition of warehouses and industrial buildings. While the core of the retail area has remained relatively stable, changes in the retail market have brought decline in some sectors. This decline is reflected in the blighted physical condition of the Lafayette Place project area.

The health and stability of the downtown economy require continual rebuilding to attract high quality commercial uses and tourism. In addition, areas which have seen a decline of business and a loss of jobs must be rewoven into the economic fabric if Boston's employment needs are to be met. The development of new retail space on Washington Street should help the Central Business District to capture a better share of the expanding metropolitan retail market. By 1985, per capita expenditures in the Boston area for shoppers' goods are expected to increase by 40% over 1972. This increase, combined with growth in population, may mean a 50% increase in sales in the metropolitan area. If new developments such as Lafayette Place draw large numbers of consumers to the downtown and existing stores maintain their current share of the area's market, sales in the Central Business District may increase by 35% over 1972.

A new retail complex with hotel can strengthen the business district's central role in other ways. In addition to generating new jobs and income, the image of the downtown can be enriched by the development of Lafayette Place. This proposed cosmopolitan complex, providing a distinctive shopping environment with hotel facilities and on-site parking, should reaffirm the belief that Boston is a good place in which to work, visit and shop.

The project site, located one block from the City's "million dollar retail corner" is idealy situated to re-enforce the positive impact of the recent investments of Filene's and Jordan Marsh department stores and a new vertical mall under construction at this same corner. At the same time, the Lafayette Place project can provide a needed link between the Central Business District retail activity and that in the Back Bay, which will be further strengthened with the realization of the Park Plaza urban renewal project.

With the impressive success of the Faneuil Hall Marketplace on the waterfront, a renewed interest has been expressed by public and private officials in the continued revitalization of the retail core. The successful completion of the Lafayette Place project should go far towards achieving this goal.

The following then, are the primary objectives of the Lafayette Place project:

1. Induce private investment and encourage economic growth, in order to generate new jobs, particularly for low income and minority workers.
2. Reinforce and strengthen commercial activity near Washington Street.
3. Encourage a mixture of uses to insure activity in the Central Business District at all hours of the day and night.
4. Develop a continuous pedestrian system by improving links to activity centers and public transportation.
5. Improve both pedestrian and vehicular circulation.

6. Provide needed hotel facilities which also can add to the "captive market" volume of shoppers in the Central Business District.

7. Provide consolidated and efficient parking facilities in the Central Business District in close proximity to retail nodes.

E. Project History and Status

Redevelopment proposals for the downtown area of Boston were originally conceived as part of the Development Program for the City of Boston, initiated by the Boston Redevelopment Authority (BRA) in 1960. In 1965, a Downtown General Neighborhood Renewal Plan was prepared and work was begun on a Central Business District Urban Renewal Plan. During the preparation of the Plan, an Early Land Acquisition Program was completed and was approved by the Authority on October 14, 1965, and by the Boston City Council on December 6, 1965. This program recommended the acquisition and redevelopment of several blighted downtown parcels for new commercial development. On December 29, 1965, an Early Land Acquisition contract was signed with the Department of Housing and Urban Development (HUD). Under this contract, the Authority acquired, on June 1, 1966, the block bounded by Washington Street, Norfolk Place, Harrision Avenue Extension, and Bedford Street, then occupied by the City Mart department store. This block later became the Bedford-West Urban Renewal Area. Until June 1973, the property was used by the BRA as a temporary relocation resource, and the building was demolished in 1974.

The Central Business District Urban Renewal Plan was completed in 1967 and was approved by the BRA and the City Council the same year. Subsequently, however, HUD informed the BRA that sufficient renewal funds were not available to carry out the entire CBD renewal program and advised the submission of separate renewal plans for smaller projects. Therefore, a renewal plan for the Bedford-West area was prepared and was approved by the BRA on February 8, 1973, and by the Boston City Council on April 23, 1973. A Loan and Grant Contract was executed with HUD on April 14, 1975. The Bedford-West Renewal Plan called for the clearance of the single structure on the site and the redevelopment of the cleared parcel for retail, commercial, office, and parking use. Street improvements and utility adjustments also were included in the renewal program.

The Lafayette Place project was conceived in 1974-75 by the Sefrius Corporation and a proposal was submitted to the Boston Redevelopment Authority. This proposal, developed in conjunction with the consolidation of the Jordan Marsh department store facilities, contemplated a multi-level, multi-use development consisting of approximately 460,000 square feet of retail space anchored by a nationally established department store, one million square feet of office space in three or four medium-rise office buildings, a 750-room hotel with convention facilities, and an MBTA pedestrian passageway linking Lafayette Place with the area's department stores. The

City, in return for the developer's commitment, agreed to construct a parking garage for 1,500-2,000 vehicles, a New Essex Street between the Southeast Expressway and Washington Street, and certain street and pedestrian improvements along Washington and Chauncy Streets. This proposal was subsequently adopted by the City Council and approved by the Mayor. On April 17, 1975, the Boston Redevelopment Authority tentatively designated Sefrius Corporation as redeveloper of the Bedford-West Urban Renewal Area, as part of the overall Lafayette Place project.

Subsequent to the approvals, the designated developer had difficulity in locating a major department store tenant and therefore was unable to obtain firm financing for the project. The City did not proceed on its activities pending financing commitments by the developer.

In an effort to make the development program more economically viable and to obtain financing, the developer made certain design and programmatic modifications to accommodate a Family Entertainment Center activity as the prime tenant. This effort also was not realized and the developer then decided to proceed without a major tenant. This resulted in the need to redesign the project and consolidate the land area in order to decrease the overall costs. At the same time, Sefrius entered into a joint venture with Mondev International and submitted a revised proposal to the Authority. The redesign called for the City to acquire land previously to be acquired by the developer and to construct a 900-car parking facility underground and to rehabilitate an existing 700 space parking facility originally scheduled to be demolished. The developers proposed to purchase the air-rights above the garage (at street level) and to construct a 3-level retail complex of 300,000 square feet and a 500-room hotel.

This is the most current plan and is the one evaluated in this Impact Statement. It is expected that the necessary public approvals of development commitments will be provided by July 1978, and that construction activity on the parking facilities will commence in early 1979.

F. Project Funding

A summary of the total funding program for the Lafayette Place project is indicated on Table I.2.

Under the Urban Development Action Grant (UDAG) Program, the City of Boston has applied to HUD for Federal financial assistance, in the amount of $8,000,000, to fund the acquisition of private property within the retail/hotel complex development site, the construction of the proposed east-west arterial street, and the widening of Chauncy Street. The remaining public investment for additional land acquisition, demolition of the vacant Jordan Marsh Annex buildings, garage construction and renovation, and street and site improvements are to be financed through Revenue and General Obligation Bonds. Retirement of the existing HUD notes

Table 1.2

LAFAYETTE PLACE PROJECT

Source of Funds

Private Investment (Sefrius/Mondev)		
1. Retail center construction	$ 9,000,000	
2. Hotel construction	29,250,000	
3. Support system construction	3,000,000	
		$41,250,000
Public Investment (City of Boston)		
UDAG Funds		
1. Property acquisition	$ 5,000,000	
2. Street construction	2,500,000	
3. Administration and contingency	500,000	
		$ 8,000,000
Bond Financing		
1. Land acquisition	$ 2,000,000	
2. Acquisition of leasehold interest in Hayward Place garage	400,000	
3. Street and site improvements	3,600,000	
4. Construction of underground garage	13,200,000	
5. Renovation of Hayward Place garage	100,000	
6. Demolition	1,200,000	
		$20,500,000
Urban Renewal Project Closeout Budget		
1. HUD note retirement (Bedford-West)		2,064,000
Total Private and Public Investment		$71,814,000

on the Bedford-West Urban Renewal Project will be funded through the project closeout budget as part of the financial settlement of the renewal project, which is scheduled to be accomplished by July 30, 1978.

In addition, Sefrius/Mondev intend to submit to the Boston Redevelopment Authority an application for the formation of a Chapter 121A Corporation, pursuant to Chapter 121A of the Massachusetts General Laws, which would insure stable taxes on the development for a minimum of fifteen years.

G. Conformance with Official Plans

The proposed Lafayette Place Development is in conformity with the 1965-75 General Plan for the City of Boston and the Regional Core, which was adopted by the BRA in March of 1965. It is also in conformity with the overall objectives and basic proposals of the Downtown General Neighborhood Renewal Plan Area (Mass. R-46) and with the Central Business District Urban Renewal Plan, approved by the Authority on August 2, 1967, and by the Boston City Council on December 11, 1967. Both the 1965-75 General Plan and the CBD Urban Renewal Plan recommended the stimulation of new retail growth and the establishment of new commercial activities, in recognition of the key functions of the downtown area. In particular, the CBD Plan specified the following planning and design objectives for this section of the downtown.

(a) To provide an improved pedestrian environment through the creation of pedestrian malls and appropriate facilities for shoppers and visitors;

(b) To provide opportunities for private development of new commercial and retail facilities;

(c) To improve the efficiency of traffic movement through the area by the clarification and rectification of the street system;

(d) To provide off-street loading and servicing facilities so that trucking and the distribution of goods will not conflict with vehicular or pedestrian traffic.

Furthermore, these plans also viewed the proximity of varied land uses (speciality shops, restaurants, entertainment facilities, etc.) to one another as an asset for encouraging maximum growth of downtown activities. By creating a new retail and commercial development similar to nearby uses, the proposed Lafayette Place project follows these previously established principles for downtown development.

The redevelopment of the Bedford-West portion of the total project area for retail and commercial use, with underground parking, is in conformance with the objectives and redevelopment controls of the Bedford-West Urban Renewal Plan (appropriate sections of which are attached as Appendix B).

Lafayette Place is intended to provide a major incentive in the continued overall redevelopment of Boston's downtown area. It is a proposal which has been in planning for a number of years and is an extension of the private investment committed to the downtown within the past 10 years. This investment includes the new Jordan Marsh and Filene's department stores, the renovated Kennedy's department store, the new Charlestown Savings Bank and Barnes and Noble Bookstore, the current renovation of the former Gilchrist department store into a vertical mall, and a number of other private developments indicative of the continued confidence in Boston's downtown.

Lafayette Place is consistent with several public development activities scheduled for downtown, which include an auto restricted zone, abandonment of inefficient,poorly located mechanical garages, new circulation systems, renovated public transportation and subway stations, and the implementation of the South Station and Park Plaza urban renewal projects. It is, furthermore, the necessary linkage between the Waterfront-Faneuil Hall-Quincy Market districts and the revitalized institutional and theatre district of the downtown.

H. Public Reaction to the Project

The Lafayette Place development proposal was submitted to both the Massachusetts and the regional clearinghouses pursuant to A-95 review requirements on December 20, 1977. No significant environmental or regional impact, or any environmental problems, were indicated by the clearinghouse comments (see Appendix C).

Between January 19 and 31, 1978, the Boston City Council held hearings on the Lafayette Place UDAG application, and no public opposition to the project was expressed.

The Chinese community, however, whose neighborhood is adjacent to the Lafayette Place project area, has voiced several concerns during community meetings about the potential impact of the project on their neighborhood. These concerns may be summarizied as follows:

(1) The impact of increased vehicular traffic in the area, which would further deteriorate the already bad air quality in Chinatown and increase health hazards for residents. Further, additional traffic could discourage tourists from visiting the area, many of which merchants and residents depend on tourism for their livelihood.

(2) Concern that Chinatown could become the backyard "dumping ground" for Lafayette Place and an area to be avoided. Therefore, the Chinese community believes every effort should be made to encourage Lafayette Place to become a link between the CBD and Chinatown, which could have a positive effect on the Chinese restaurant trade and the Chinese retail operations.

(3) The fear that the Chinese community will be squeezed out by rising property values due to increased development pressures and real estate speculation.

(4) Expansion of job opportunities for the Chinese residents, including implementation of job training programs for the area's youths to learn construction skills in order to qualify for construction jobs in the Lafayette Place development, and the provision of permanent jobs in the hotel and retail facilities.

Specific mitigation measures to minimize these impacts will be described in Part IV of this Statement, as well as in the discussion of the socio-economic environment (Part II.B). With the resolution of these concerns, the Chinese community feels that it can look forward to the Lafayette Place development and will support it, provided the City works to mitigate any potential adverse effects on their neighborhood. Having recently announced plans to form an economic development corporation to implement a program to upgrade the area and improve economic opportunities, the Chinese community also has expressed considerable interest in forming a link between Lafayette Place and Chinatown, creating thereby a viable "back door to Boston."

PART II DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS AND PROBABLE IMPACT OF THE PROJECT

Part II DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS AND PROBABLE IMPACT OF THE PROJECT

Part II.A PHYSICAL ENVIRONMENT

1. Land Use and Physical Characteristics

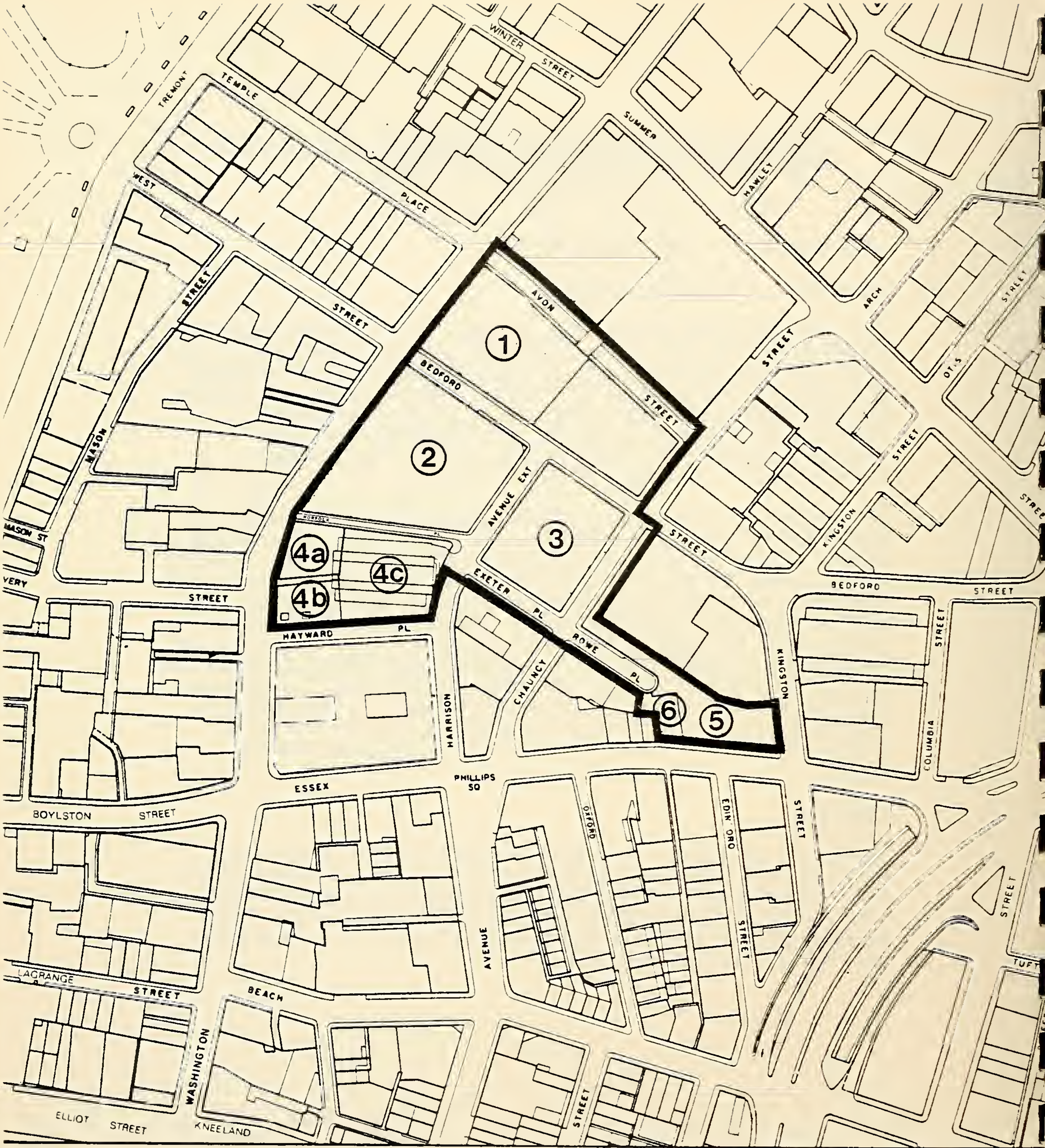
a. Description of Existing Conditions

The Lafayette Place project area is located at the southern edge of the commercial core of Boston, in the heart of the downtown, one block from the 100 percent retail corner of the city. Surrounding land uses are those typical of an urban business center - a mixture of retail commercial, consumer services, offices, restaurants, entertainment places and the like. It is adjacent to the city's adult entertainment district to the south and a small garment industry district to the southeast.

The project area encompasses 261,900 square feet (6.0 acres) of predominantly open or unutilized land and is bounded by Washington Street, the downtown's major shopping artery, on the west, Hayward Place, Exeter Place, Rowe Place, and Essex Street on the south, and the Boston Edison Kingston Street substation, Chauncy Street, and Avon Street on the west and north. The proposed retail/hotel complex and underground garage will occupy that portion of the site located between Washington and Chauncy Streets and Avon Street and Hayward and Exeter Places. The remainder of the site development includes the rehabilitation of the existing Hayward Place garage at Washington Street and Hayward Place and the construction of an arterial street within the extension of the project site to Essex Street.

Land Use

Currently, the site is occupied by a group of eight vacant retail buildings (the former Jordan Marsh Annex) which completely covers the block between Avon and Bedford Streets, four paved parking lots, a City-owned mechanical parking garage (the Hayward Place garage) and City streets, as indicated on Table II.A.1 below (also see Figures II.A.1 and II.A.2).



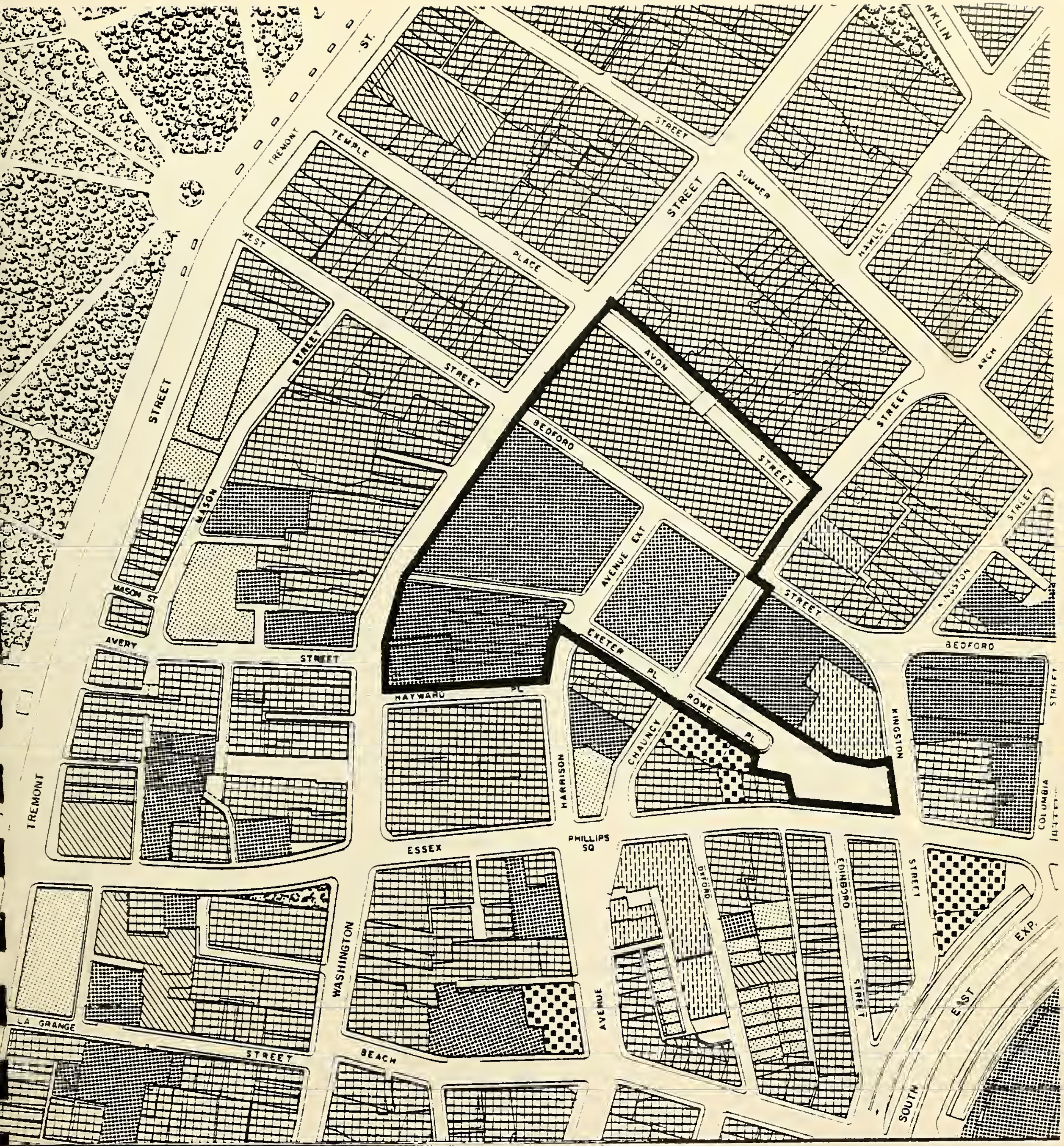
LAFAYETTE PLACE

PROJECT AREA PARCELS

Figure II. A.1

N

BOSTON REDEVELOPMENT AUTHORITY



LAFAYETTE PLACE

EXISTING LAND USE

Figure II.A.2

BOSTON REDEVELOPMENT AUTHORITY

Table II.A.1

Lafayette Place - Existing Land Use

Parcel	Land Use	Area (Sq. Ft.)	Percent of Site Area
1.	Vacant retail	55,904	21.4
2.	Parking - Raymond's site	51,293	19.6
3.	Parking - Bristol Block site	28,519	10.9
4.	Hayward Place garage and parking lots	35,722	13.6
5.	Parking - Boston Edison site	4,670	1.8
6.	Vacant land (Edison)	17,832	6.8
	Public streets (Avon, Chauncy, Bedford, Harrison Ave. Extension, Norfolk Pl., Exeter Pl., Rowe Pl.)	67,960	25.9
		261,900	100.0

The Jordan Marsh Annex buildings were vacated by Jordan Marsh in 1977 as part of a modernization program in which their retail and office operations were consolidated into a new structure, attached to their main store, at Washington and Summer Streets. The former Annex buildings, which vary in height from four to ten stories, are generally in fair to poor condition, having suffered from lack of maintenance in recent years. Although physically separate buildings on the exterior, the interiors were completely opened up by Jordan's to facilitate their retail operations.

Of the parking lots within the site, two were created in recent years by the Boston Redevelopment Authority and one by the Boston Edison Company as temporary uses pending redevelopment. The fourth lot, owned by Code Realty Company, has existed since 1963. The Hayward Place garage was built by the City of Boston in 1958. Its inefficient mechanical operation has led to low rates of occupancy; a 1972 study showed its maximum use at only 31% of capacity. The combined capacity of the four parking lots is 362 vehicles, and there are 700 spaces in the garage.

Five public streets are included within the project area, as are two private ways. Avon Street was closed as a public way in 1975; the other streets sill serve as traffic carriers or as access routes to the parking lots and the garage. The open land adjacent to the Edison substation, which is included within the right-of-way of the proposed east-west arterial, currently is covered with stone chips and is not used.

Although now operating marginally from a land use point-of-view, the project site was once a thriving retail area. The block between Bedford Street and Norfolk Place, since 1966 an urban renewal parcel, formerly was occupied by the R. H. White Department Store and later by Raymond's; both of these suffered failure due to the decline of the downtown in the 1950's and 1960's. The Bristol Block parcel to the rear, until 1975, was occupied by the Jordan Marsh Basement store, and the block now occupied by the Edison substation contained several retail and wholesale stores and clothing manufacturers.

Today, the large expanse of open area filled with cars and the vacant, boarded up buildings create a depressing effect and break up the continunity of the Washington Street commercial area. The use of the vacant land for parking not only adds to congestion in the area but also detracts from the commercial vitality of the downtown shopping district.

Property Ownerships

Of the 6.0 acres of the project site, some 119,813 square feet of land and rights-of-way or 45.8% is privately owned; the remainder, including the public street areas, is owned either by the City of Boston or the Boston Redevelopment Authority. The private owners include Allied Realty Corp., Boston Edison Company and Code Realty Company (Table II.A.2 and Figure II.A.3). Figure II.A.4 indicates those properties which are to be acquired by the City of Boston.

Table II.A.2

Lafayette Place - Existing Ownership

A. Private

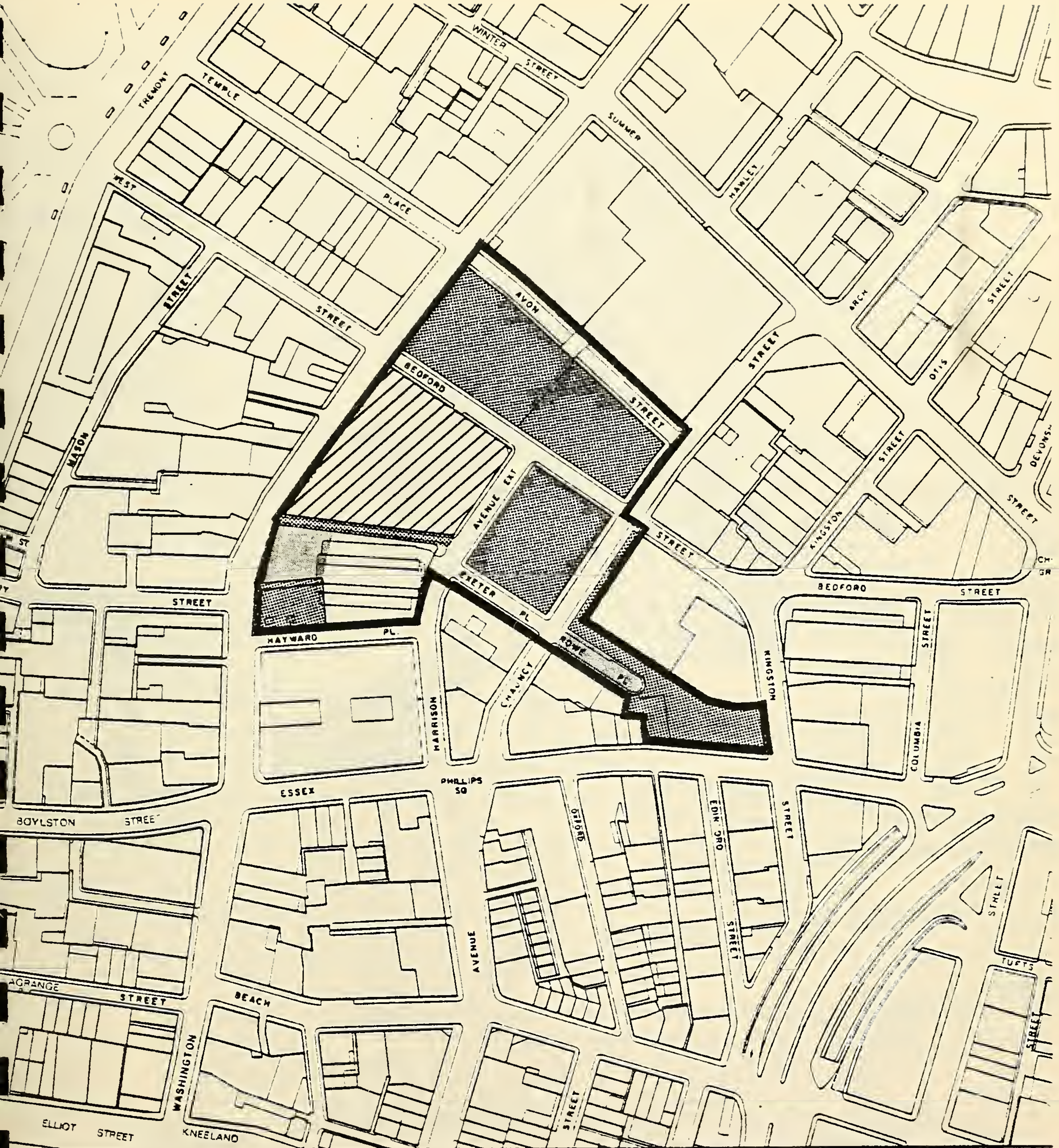
Parcel	Owner	Area (Sq. Ft.)	Percent of Private Ownership	Percent of Total Ownership
1	Allied Realty Corp.	55,904	70.4	32.3
3	Allied Realty Corp.	28,519		
4(a)	Code Realty Co.	6,754	10.8	4.9
(b)	Code Realty Co.	6,134		
5/6	Boston Edison Co.	22,502	18.8	8.6
		119,813	100.0	45.8

B. Public

Parcel	Owner	Area (Sq. Ft.)	Percent of Public Ownership	Percent of Total Ownership
2	Boston Redevelopment Authority	51,293	69.2	19.6
4(c)	City of Boston	22,834	30.8	8.7
		74,127	100.0	28.3

C. Street Ownership

	Area (Sq. Ft.)	Percent	Percent of Total Ownership
Public Streets	57,410	84.5	21.9
Private Ways	10,550	15.5	4.0
	67,960	100.0	25.9



▩ PRIVATE

▨ BOSTON REDEVELOPMENT AUTHORITY

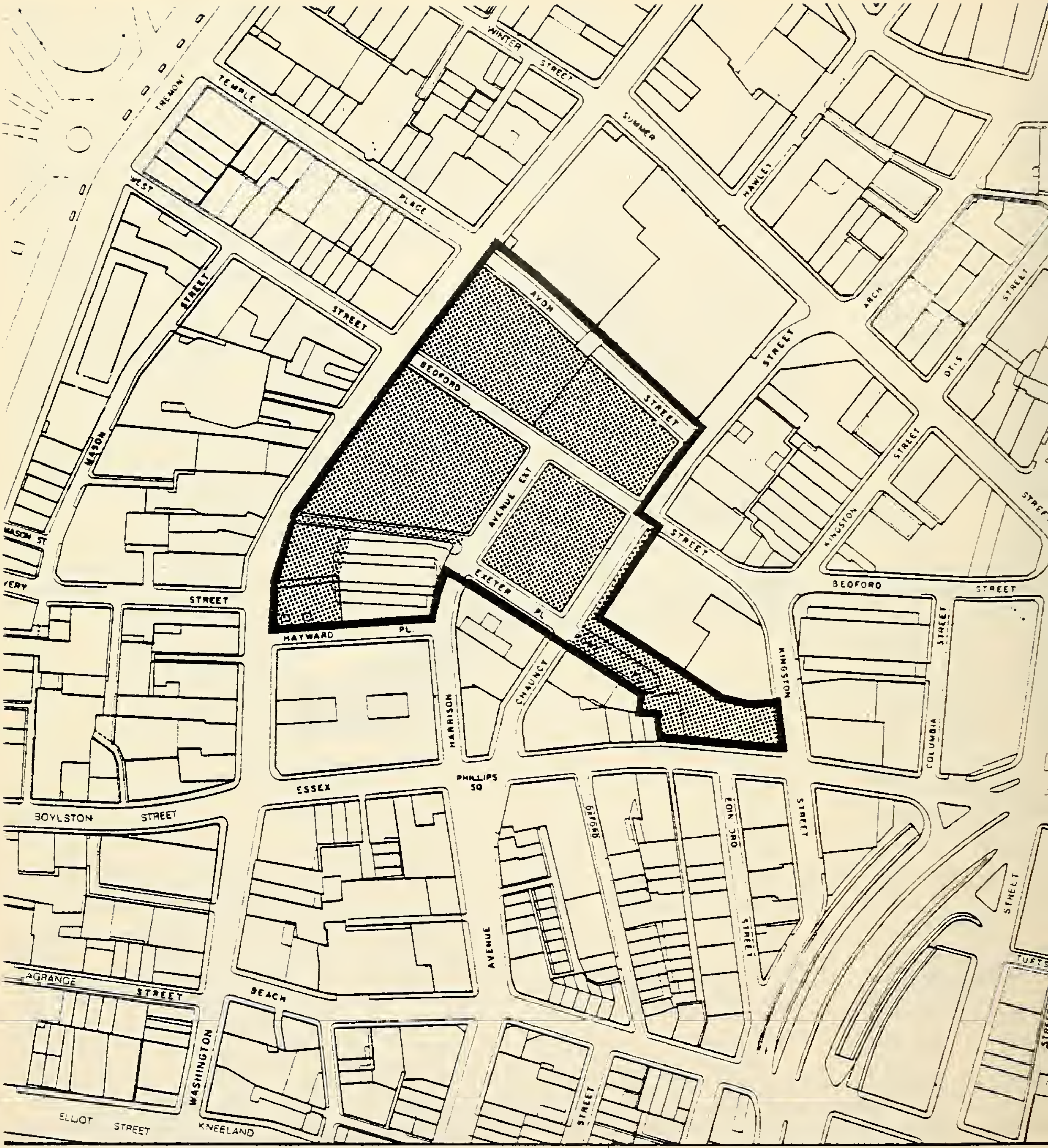
☐ CITY OF BOSTON

LAFAYETTE PLACE

LAND OWNERSHIP
WITHIN PROJECT AREA

Figure II.A.3

BOSTON REDEVELOPMENT AUTHORITY



▨ **PROPERTIES TO BE ACQUIRED BY CITY OF BOSTON**

0 200 400 FEET

LAFAYETTE PLACE

PROPERTY ACQUISITION

Figure II.A.4

BOSTON REDEVELOPMENT AUTHORITY

Under the proposed development plan, there will be a major change in the public/private ownership mix. The City of Boston, through acquisition or eminent domain proceedings, will acquire the Allied and Code Realty properties for the garage/retail/hotel development and 22,500 square feet of Boston Edison property for new street construction and street widening purposes. The City will also acquire the Bedford-West Urban Renewal parcel from the Redevelopment Authority. As a result, all of the land within the project area will be under City ownership. The developer, in turn, will purchase the air rights over the underground garage to permit the construction of the retail center and hotel.

Zoning

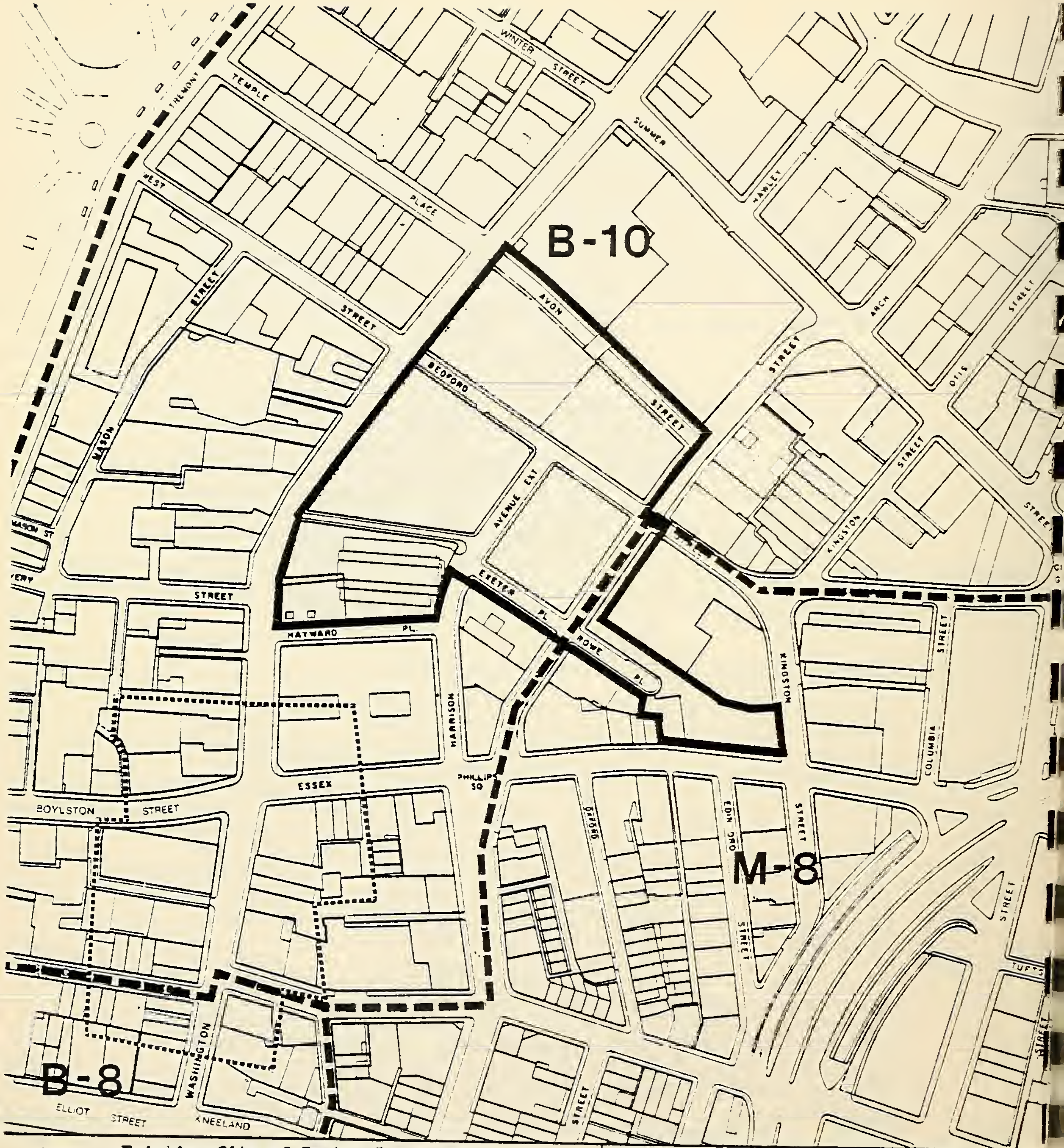
With the exception of the extension of the project site east of Chauncy Street, the project area is wholly located within the B-10 general business district, which allows a floor area ratio (FAR) of 10 (Figure II.A.5). Retail, hotel, and office uses are all permitted uses in the B-10 district. East of Chauncy Street, where the new east-west arterial will be extended, is a M-8, light manufacturing, zone. In addition, the entire project area falls within a Restricted Parking District, a zoning map overlay district created in 1972 and covering the entire downtown area. Within this district, all parking is a conditional use, subject to review and approval by the Zoning Board of Appeals.

Physical Characteristics of the Project Environs

As noted above, the Lafayette Place project area occupies a critical downtown location at the edge of the retail district. The existing land use pattern in the environs of the project site is predominantly high density retail commercial, office, consumer services, and places of entertainment. Figure II.A.6 indicates the functional districts of the downtown area. Immediately to the north is the heart of the downtown retailing district, at the corner of Washington and Summer/Winter Streets, where are located the city's two major department stores and a third, recently vacated, which is undergoing conversion as a new vertical retail mall. Washington, Summer, and Winter Streets form the major spines of downtown retailing which extends into the side streets leading off these arteries.

To the east of the project site is an area of marginal retail and office uses which was developed immediately after the Great Fire of 1872, which destroyed a major portion of the downtown area. A BRA downtown planning study undertaken in 1969 characterizes this area as being "soft" for development, with generally poor building conditions, low valuations, high vacancies, and underutilization.

Somewhat better conditions exist in the area west of the project site, between Washington Street and the Boston Common. Buildings in this area are a mixture of late nineteenth century to pre-1940 structures,



▬ ▬ ▬ Existing City of Boston Zoning Boundaries

┈┈┈ Adult Entertainment District Overlay

▬▬▬ Project Boundary

USE: B - Business
M - Light Manufacturing
Number Denotes Floor Area Ratio

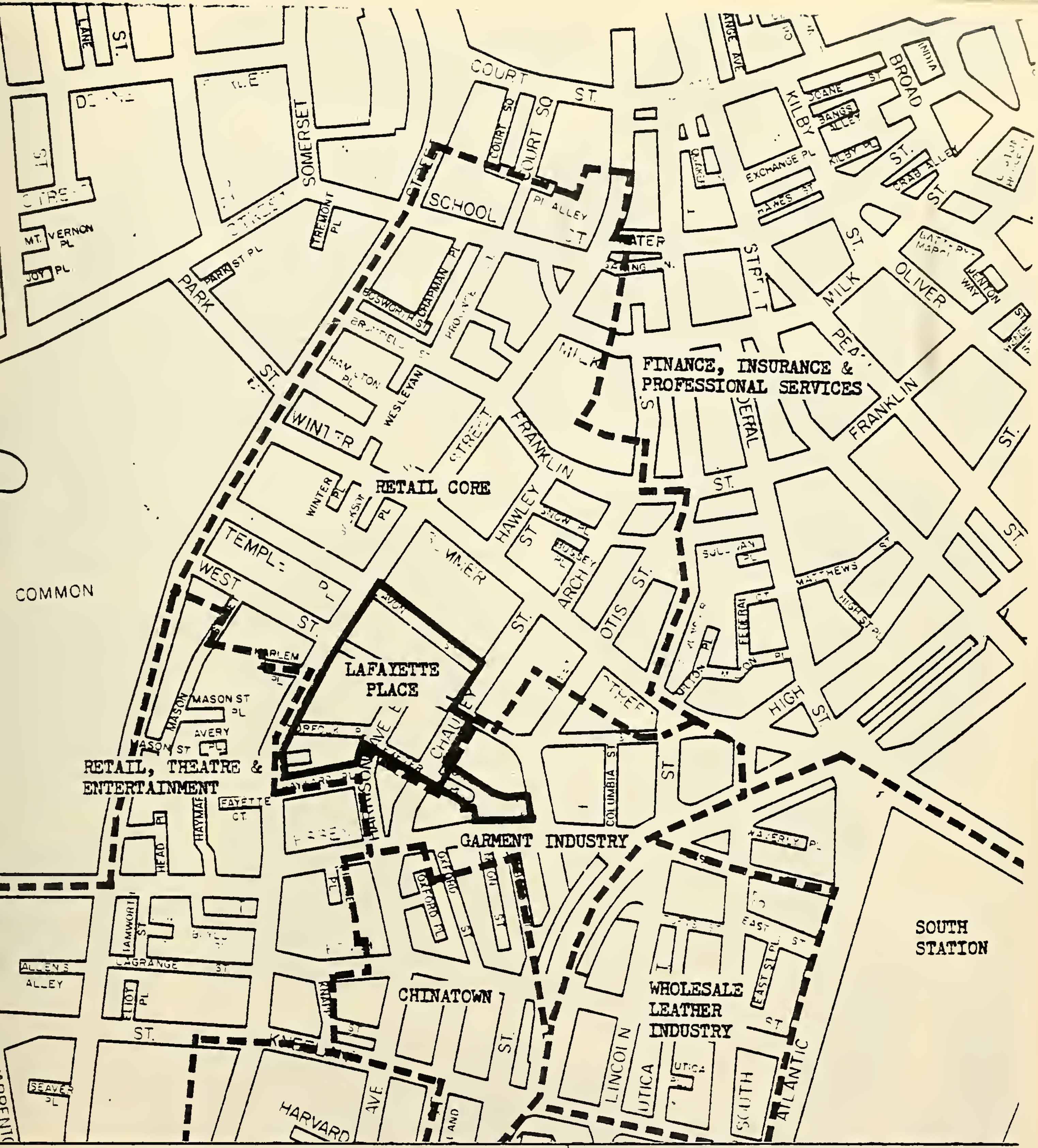
0 200 400 FEET

LAFAYETTE PLACE

EXISTING ZONING

Figure II.A.5

BOSTON REDEVELOPMENT AUTHORITY



0 800 1600 FT

LAFAYETTE PLACE

CBD - FUNCTIONAL AREAS

Figure II.A.6

BOSTON REDEVELOPMENT AUTHORITY

with retail shops on the ground floor but the upper floor often being vacant. In this area also are found a grouping of theatres and movie houses that have been declared eligible for listing on the National Register of Historic Places. Some residential enclaves - Tremont-on-the-Common, the former Touraine Hotel, and the proposed 80 Mason Street elderly development - are located in this area too. Although the area also has been characterized as potentially "soft", it does have a rehabilitation desirability. A 1976 BRA study[1] of these blocks proposed their upgrading through the conservation of noteworthy buildings and the character of the area, the development of a mid-block pedestrian system and arcade, improvement of vehicular circulation, and the introduction of residential and theatre uses and pedestrian-generating retail uses. Special zoning and design guidelines also were proposed.

One block south of the project site, along Washington Street, is the city's adult entertainment district, established in 1974 to concentrate "adult" uses, such as strip bars and nightclubs, pornographic book stores, and X-rated movie houses. These uses, however, have had a negative influence on neighboring properties and have threatened the revitalization of the downtown shopping area. Within this area is a potential site for a new Federal office building, which, along with planned institutional buildings along Kneeland Street and further improvements to the city's legitimate theatre district, should help to counteract the vacancies and adverse impacts caused by the "adult" entertainment uses.

To the southeast is Boston's Chinese residential and business community, together with a small garment industry district. In this section, three and four story townhouses are found mixed with multi-storied loft-type mercantile and manufacturing buildings.

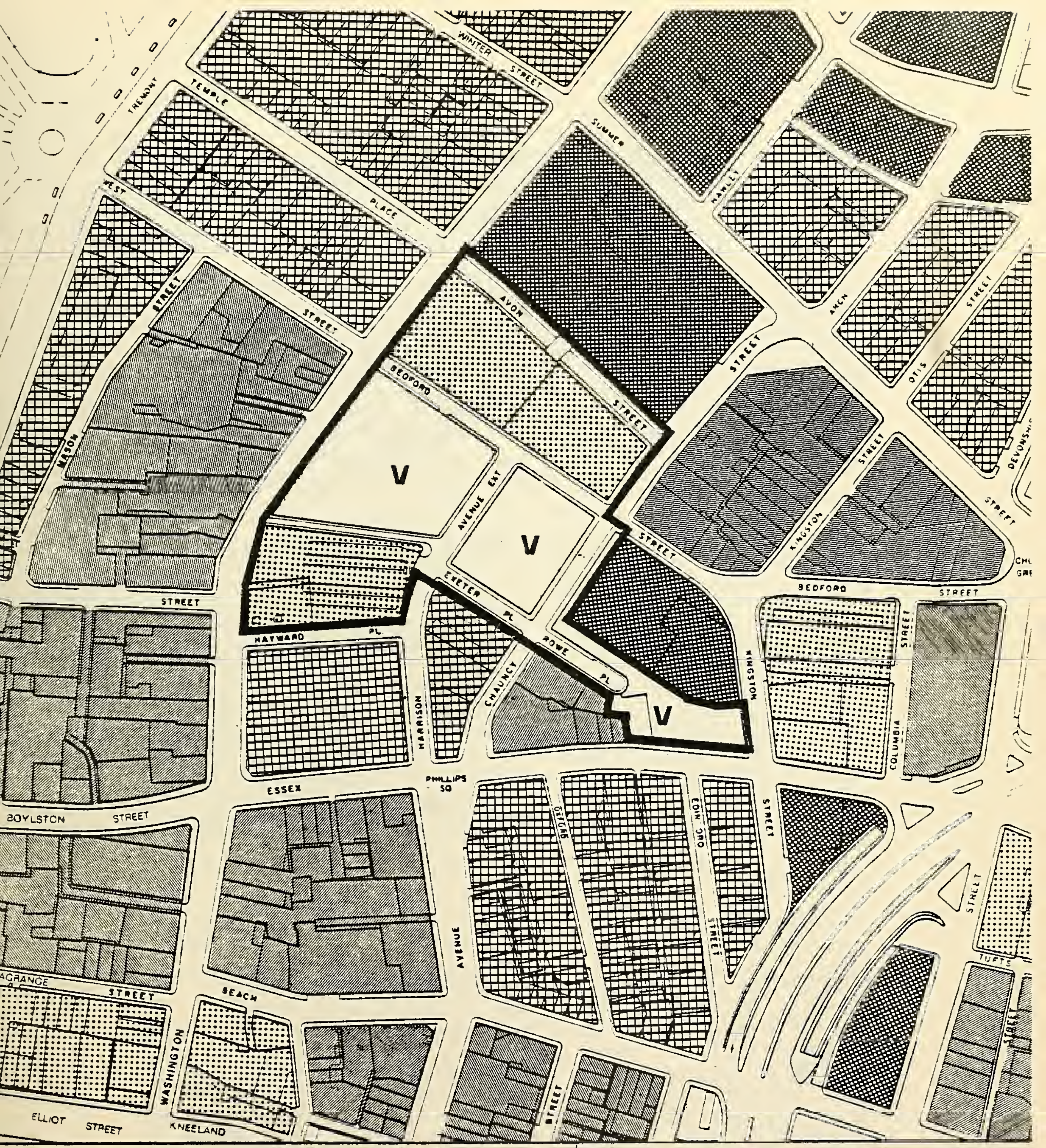
In general, the area surrounding the project site is intensely developed, with moderately-high density. Most of the parcels are fully built-up, although there are a few scattered vacant lots used for open parking. Building heights are generally 5-7 stories, with a few buildings reaching as high as 10-11 stories. This area is zoned either for General Business, with a floor area ratio of 10 or, on the southeast, for Light Manufacturing (FAR of 8); however, existing FAR in the general area averages from 4 to 7.

For the most part, the surrounding buildings date after the Great Fire of 1872 to pre-1940. The late 19th century structures are generally relatively small commercial buildings, while those of the early 20th century are larger mercantile and loft-type buildings. Many of the pre-1900 buildings are deteriorated and poorly maintained. Buildings to the north and west of the project site are generally in better condition than those to the east and south (see Figure II.A.7).

Several recent new developments in the immediate environs of the Lafayette Place project area demonstrate the renewed vitality of the retail core and the general upgrading underway in the downtown.

---

[1] Boston Redevelopment Authority, The Tremont Street Special District, Boston, January, 1976.



PERCENTAGE OF BUILDINGS PER BLOCK NEEDING MAJOR REPAIRS

▩	less than 10%
▦	between 10% & 40%
▨	between 40% & 80%
░	greater than 80%
V	vacant block

0 200 400 FEET

LAFAYETTE PLACE

BUILDING CONDITIONS

Figure II.A.7

BOSTON REDEVELOPMENT AUTHORITY

In addition to the Jordan Marsh modernization program, both Filene's and Kennedy's have upgraded their facilities with new construction or rehabilitation. Under the CBD urban renewal program, Woolworth's completed in 1970 a new $8.5 million variety store which has become one of its most successful outlets. A number of moderately sized office buildings also have been completed, including the Charlestown Savings Bank on Summer Street, the Provident Institute for Savings on Winter Street, 141 Tremont Street and 175 Summer Street, and the renovation of the former Record-American Building. Within the larger downtown area several major high-rise office buildings have been erected in the city's financial district, including the Shawmut, First National, and the Federal Reserve Bank buildings, One Boston Place and 60 State Street. The extremely successful restoration of the Quincy Market buildings as a shopping center near the waterfront has been very influential in the more recent surge of downtown revitalization projects.

Major future projects in the surrounding area that can influence the success of the Lafayette Place development include the South Station Transportation Center and the Park Plaza renewal project. The South Station project, located some five blocks to the east, will be a joint undertaking by the Federal Railway Administration and the Massachusetts Bay Transportation Authority to renovate the existing South Station railroad station into a major intercity and commuter rail and bus facility with a 2,000 car parking garage and potential future hotel and/or office development. The Park Plaza project, four blocks to the west, proposes the construction of a 480-room hotel, 300 apartments, 155,000 square feet of retail space, 1,250 parking spaces, and over 1,000,000 square feet of office space. The first phase of development, the construction of a State Transportation Building on Stuart Street, between Tremont and Charles Streets, is expected to be underway within a year. Proposals for the remainder of the project are now being solicited by the BRA.

In addition the Redevelopment Authority recently has completed a planning report[1] outlining a strategy for the revitalization of the Lower Washington Street Area, immediately south of the Lafayette Place project site. Recognizing the multitude of development pressures on this area and the need to coordinate existing and planned projects, as well as to encourage additional new development to reverse the area's recent decline, this study has focused on a program for the construction and rehabilitation of new-housing, retail, and office facilities and for the expansion of Chinatown to Washington Street to link together a wide variety of urban activities. Up to 940 units of housing are envisioned in the program, which also recommends the preservation of the area's theatres for entertainment-related uses to strengthen the adjacent legitimate theatre district. The implementation of these proposals in the future would serve to enhance the opportunity for the success of the Lafayette Place project and would provide an added market for its retail components.

---

[1] Boston Redevelopment Authority, Lower Washington Street Area - A Program for Revitalization, Boston, June, 1978

b. Impact of the Proposed Project

The proposed mixed retail commercial/hotel use of the project area is entirely compatible with the existing land use pattern of the surrounding area, which is the retail core of the City of Boston. The project will not change existing or planned land use but rather will serve to strengthen the retail function of the downtown at its southern edge. It will promote the development of a coherent land use pattern in this section of the Central Business District, consistent with the "highest and best" use of the project site as it relates to the adjacent retail core. The project thus should have a beneficial effect on the success of other public and private redevelopment plans for the area. At the same time, the existing character of the surrounding environment should not adversely affect the proposed new development, due to the area's land use compatibility and the general stability of the commercial center of Boston.

The proposed development will help significantly to eliminate the adverse environmental effects of an underutilized area with discontinuous linkages to the rest of the downtown. Demolition of the vacant, deteriorating buildings, elimination of the surface parking lots and redevelopment of the site with a modern structure further will have a positive impact on surrounding properties by promoting confidence in the area's future and by encouraging rehabilitation efforts in existing deficient buildings. Redevelopment can thus serve to stimulate the upgrading of this declining section of the downtown, particularly along Washington Street, in keeping with the Authority's long-range plans for the Central Business District.

Not only will the proposed Lafayette Place development be the most productive use of the site, but it will also help fulfill the planning goal of the City to link the retail core with the newly revitalized theatre district and the future Park Plaza project.

The scale of development proposed for the project will be compatible and in keeping with that in the neighborhood of the project area. Average FAR in this section of the downtown is 4-7. The Lafayette Place project will have an FAR of 4.8. Therefore, there will be no excessive increase in building density, as a result of this project. The major change in the general physical character of the immediate area will be the presence of the 42 story hotel tower. However, the tower will be set back from Washington Street at a considerable distance (approximately 300 feet) and thus will not interrupt or adversely effect the generally uniform heights of the Washington Street facade. On the other hand, the effect of the addition of another high-rise to the Boston skyline is a matter of subjective aesthetic judgement.

The retail and hotel uses of the proposed project are all permitted by the Boston Zoning Code in a B-10 district. Since the project area is located within the Restricted Parking District, an application for a conditional use permit must be filed with the Zoning Board of Appeals prior to obtaining the necessary building permits. Section 6 of the Zoning Code requires a public hearing to held prior to granting permission for a conditional use, and, in the case of a parking garage, after certain conditions in Section 6-3A of the Zoning Code have been met.

Impact on the Environs

Lafayette Place is intended to create a viable mixed-use complex with a twenty-four hour population in an area which today is deteriorated and only marginally used. The project should enhance the attractiveness of the retail area to the north by providing new retail uses designed to attract a regional market, by adding a new market of hotel guests and visitors, and by eliminating the vacant lots and buildings which at present create an eyesore effect. Similarly, the provision of a high-quality mixed use environment will improve the public safety, appearance and image of lower Washington Street.

The proposed project is expected to have two effects on the commercial/residential area to the west. First, after a possible initial period of instability and vacancy, the project should improve the prospects for retail businesses on the west side of Washington Street and the lower "ladder blocks". Second, by creating a 24-hour population and a mix of activities, Lafayette Place should contribute to the security and amenity of the residential uses located here.

While the impacts on most of the environs are anticipated to be positive, the effects of the Lafayette Place development upon the Chinatown neighborhood are less easily predicted. Because Chinatown has lost considerable land in the past twenty years to institutional expansion and the Massachusetts Turnpike construction, the community is acutely concerned about possible land speculation arising from Lafayette Place. Similarly, concerns have been expressed regarding congestion and adverse air quality impacts caused by traffic using Beach Street as a route from the Expressway to the project area and the downtown. (More detailed discussion of these and other concerns is contained in Section B.1 below.)

Several points can be made in regard to these impacts:

1) The reduced scale of the currently proposed project, and particularly the elimination of an earlier proposed convention center, both reduce the likelihood of extensive speculation in Chinatown and the Garment District.

2) Similarly, the project no longer incorporates the parcels east of Chauncy Street as part of the development.

3) The City is pursuing strategies for preventing speculation in Chinatown which are beyond the scope of this project, i.e., developing a housing policy for Chinatown, improving City services, changing tax policies, etc.

4) Certain elements of the Lafayette Place project are potentially beneficial to Chinatown, including the possibility of hotel and retail jobs, new pedestrian connections to the downtown, an improved environment on lower Washington Street, and new retail and entertainment uses to serve the community.

5) The BRA has and will continue to work with the Chinese community to mitigate possible negative impacts and to pursue positive effects for Chinatown businessmen and residents.

Part II.A PHYSICAL ENVIRONMENT

2. Land Conditions

a. Description of Existing Conditions

Land Form and Topography

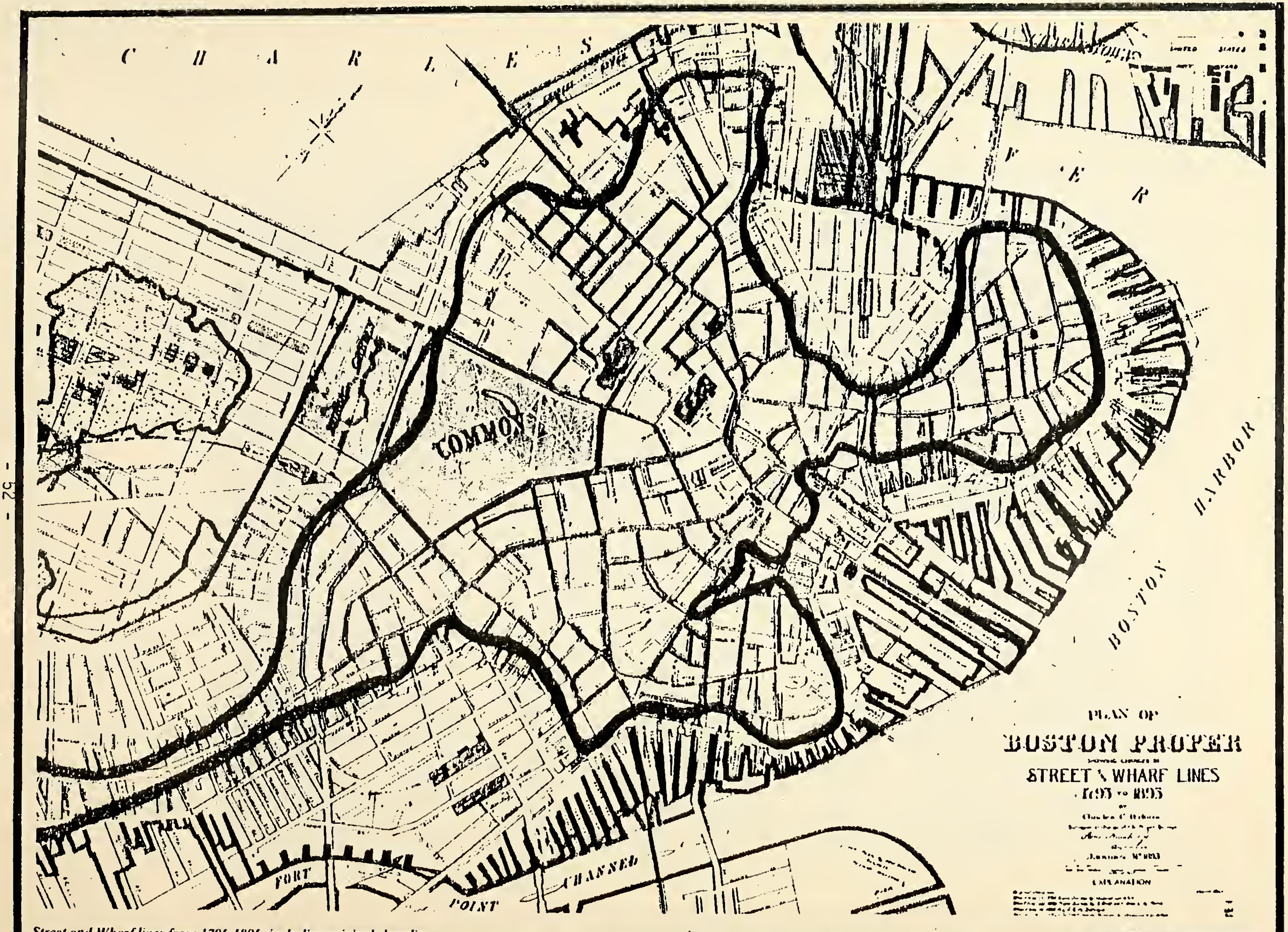
The Lafayette Place project site is located near the southwestern edge of the Shawmut Peninsula, a hilly promontory jutting into the Boston Harbor on which was founded the original settlement of Boston. This peninsula was connected to the mainland by a narrow isthmus (along the present alignment of Washington Street), which was surrounded by shallow-tidal marshes and coves that were subsequently filled in as the City expanded (Figure II.A.8).

The topography of the site is basically flat, sloping gently from north to south. Elevations vary from 36.5 feet (Boston City Base) at Washington Street and Avon Street to approximately 18 feet B.C.B.) at Harrison Avenue Extension and Exeter Place.

Geologic and Soil Characteristics

The project site lies in the Boston Lowland, which is centrally located in the Boston Basin (Figure II.A.9). The bedrock geology of the area consists of the Cambridge Formation, overlain by glacial till and interbedded layers of sands and clays topped by fill material. The bedrock is a thick sequence of sedimentary rocks deposited over a long period of time by the erosion of the surrounding hills. This sequence consists of conglomerate at its base and argillite with occasional sandstone at the top. After the Carboniferous Period, these rocks were uplifted, faulted, and folded into an overall basin structure with numerous minor folds. A long period of erosion and weathering ensued until the beginning of the glacial period about one million years ago.

All the soil units of the Boston area owe their origin to glacial and post-glacial activity. The glacial till which overlies the bedrock was deposited directly by successive advances of the overriding ice sheet, with intermittent stream activity. The final retreat and melting of the ice sheet brought an attendant rise in the sea levels (some 50 feet above their present elevation) and inundated the area with marine waters. During this stage, marine clay was deposited over the area. It is sandy in places, and the yellow color near its surface represents a weathered horizon formed during the gradual dropping of the sea and exposure of the clay. More recently, in the project area, the natural surface has been continually worked over and altered by human occupation.

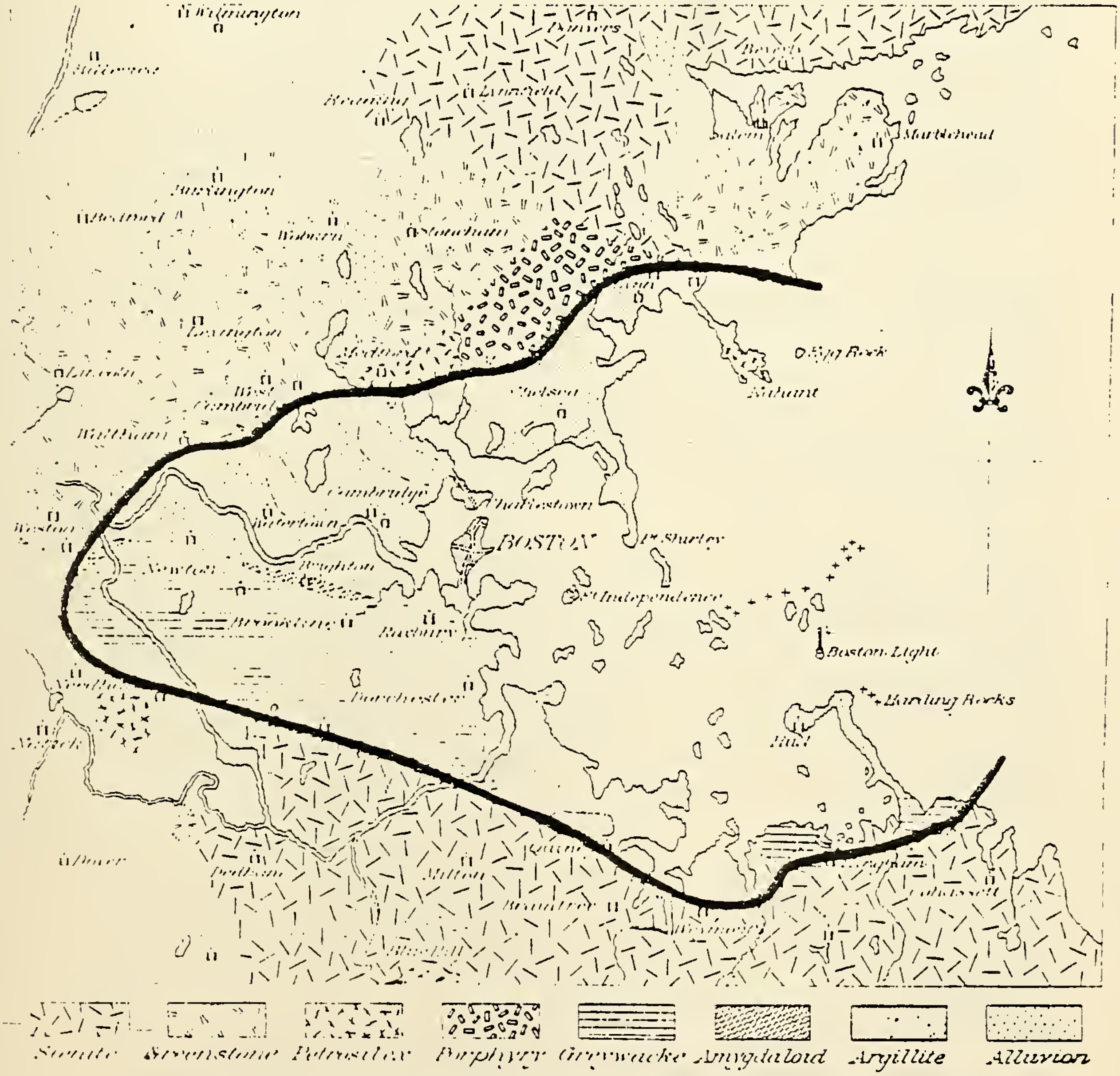


Street and Wharf lines from 1795-1895, including original shoreline.

Courtesy of the Bostonian Society

Figure II.A.8: OUTLINE OF ORIGINAL BOSTON PENINSULA AND FILLED LAND (1795-1895)

BOSTON BASIN



EARLIEST GEOLOGIC MAP OF THE BOSTON DISTRICT

After Dana, J. F. and S. L., Outlines of the mineralogy and geology of Boston and its vicinity, with a geological map, Boston, Cummings & Hilliard, 1818. Also in Am. Acad. Arts and Sci. Mem., vol. 4, 1818.

Figure II.A.9 Geologic Map of the Boston Basin

Subsurface soil structure within the project site is indicated by boring profiles completed by Haley and Aldrich Engineers in 1974 (see Appendix D). The oldest subsurface unit is the bedrock, known locally as Cambridge Argillite, with a varying surface from elevation 43.4 feet to 64.7 feet. The rock is very soft to soft with a mottled gray color that contains quartz veins and gabbro dike rocks and exhibits a slight metamorphic nature similar to phyllite. The Cambridge Argillite is Carboniferous in age (350 million years old) and is estimated to be 2,000 to 4,000 feet thick. The rock is well stratified and thinly bedded, with a dip of about 50 degrees.

The glacial fill overlying the bedrock surface is generally a very compact, gray, heterogeneous mixture of silt and clay-sized particles, sand, and gravel with occasional cobbles and boulders. The standard penetration resistance varies from 19 to more than 100 blows per foot. While the general density of the glacial fill is very compact, the upper few feet often are softer due to exposure to marine conditions following retreat of the glacial ice. These glacial deposits range in thickness from approximately 30 feet to over 55 feet.

The marine deposits are a series of substrata which were probably the result of sea level fluctuations and wave action that caused sands and gravel to be deposited in shallow water and clays to be deposited in deeper off-shore waters. In general, the boring cross-sections of the marine deposits, from top to bottom, indicated interbedded medium stiff to very stiff, yellow-brown to gray, silty clay and medium compact to compact, rust-brown to gray-brown fine sand overlying a soft to stiff, gray, silty clay with fine sand lenses. These deposits vary in thickness from 2 to 25 feet. The standard penetration resistances in the marine deposits vary from 7 to 30 blows per foot with some values up to 40 blows per foot.

The surficial fill material consists of loose to compact granular soils with a mixture of brickbats, wood, cinders, concrete and other miscellaneous materials. The general depth of fill varies from 6.5 feet to 15 feet, and is generally present across the entire site.

Hydrology and Ground Water Conditions

Drainage and surface runoff in an area are directly related to the slope of the land, vegetation, and the permeability of the surface. The Lafayette Place project area and environs is an intensively urbanized, generally flat area almost totally covered by man-made surfaces impervious to water. There are no vegetative covering or surface water sources in the area[1]. Therefore, all precipitation that does not evaporate flows directly into the existing storm drainage system. Runoff from the paved surfaces and rooftops is rapid. Although these man-made surfaces do not experience erosion and sedimentation problems, they do increase the pollutant load carried by the storm sewers; and the runoff carries with it chemicals and road dirt found in urban areas.

---

[1] As an historical note of interest, a pond, known as Wheeler's Pond, did exist on the site near the northeast corner of Washington and Bedford Streets in the early Colonial days of Boston. A 1645 map indicated this pond as the town watering place, and Bedford Street was originally named Pond Street.

The relatively complex soil conditions found in the project area tend to promote an equally complex groundwater regimen, which in turn is rendered more complicated by human activities. Ground water levels vary with precipitation and tidal levels and, in the Boston area, ground water is also recharged by sewer and water main leaks, the Charles River Basin, and the Muddy River. According to the U.S. Geological Survey, Groundwater Branch, groundwater levels in Boston are influenced far more by man-made construction than by natural factors. In the future, a somewhat higher water table may be expected as old brick sewers are replaced with new reinforced concrete sewers.

The water table in the Shawmut (Boston) Peninsula generally is close to sea level. However, a relatively high water table does exist along lower Washington Street, reflecting the combined effects of recharge from sewer and water main leaks and low permeability through the fine-ground and poorly sorted deposits, which hinder shallow groundwater movement.

Within the project site, stabilized groundwater levels observed during boring investigations varied from elevation 7.5 feet to elevation 1.2 feet or approximately 27.7 to 30.4 feet from the surface. These levels were generally lower than had been anticipated. Confirming the U.S.G.S. observations, it was noticeable that the water levels were influenced by existing structures such as the Washington Street MBTA tunnel and adjacent buildings with sump pumps in operation[1].

Natural or Man-made Hazards

The project site is located in a relatively stable geologic zone and is only moderately susceptible to a natural disaster caused by faulting or eruption of the earth's crust. Nevertheless, according to the "Seismic Risk Map of the United States", the U.S. Geological Survey has placed Boston in earthquake zone 3, the highest possible rating (ratings are based on known geologic formations, evidence of strain release, and historical records of known earthquakes). The major reason for Boston's high risk rating is a 1755 earthquake off the coast of Cape Ann, which measured an intensity rating of VIII on the Modified Mercalbi Intensity Scale. No earthquakes of as great an intensity have occurred since then, and there is some speculation that the records of the 1755 earthquake are somewhat exaggerated. Moreover, historical records indicate that the probability of a damaging earthquake occurring in Boston is about 30 times less than for San Francisco, which is in the same seismic risk zone.

---

1. Haley and Aldrich, Inc., Report on Pilot Test Borings and Groundwater Observation Wells, Lafayette Place, Boston, Massachusetts, Cambridge, May 1974.

According to maps prepared by the Federal Insurance Commission of the U.S. Department of Housing and Urban Development, the project site does not lie within or immediately adjacent to any special flood hazard areas.

The only potential man-made restriction to the development of the project site is the existance of the MBTA Orange Line subway tunnel under Washington Street, in front of the site. The tunnel roof is approximately five feet below the street surface and the tunnel wall, at its closest, is within eight feet of the parcel boundary. This tunnel location will present a constraint to both the demolition and construction phases of the project, requiring normal precautionary measures to protect this facility.

b. Impact of the Proposed Project

The existing topographic and subsurface geologic and soil conditions are not expected to present any unusual construction problems for the proposed Lafayette Place development. The surrounding area has long been built upon by man with successive stages of development. Existing buildings on and adjacent to the site have been constructed in the past with sub-basement levels, which have required precautions to maintain groundwater levels as well as the use of sump pumps to prevent flooding after construction. Several high-rise office buildings have been erected in the downtown area in recent years, without encountering any significant problems.

The project site, being generally level and flat, does not lend itself to any radical changes in land form. The major impact would be the excavation for the underground garage. Since the base of the garage will be at approximately elevation +4, it is expected to intrude the water table. The loading area also will be approximately 7 feet below the water level. As a result, site excavation will penetrate into the water table, which will require site dewatering to insure maintenance of existing groundwater levels as close as possible to the construction site. It is practically impossible to excavate below groundwater levels without causing some measurable change in the surrounding water levels, but it is not necessarily true that changes in water levels automatically result in damage to surrounding property. Therefore, an adverse impact on groundwater levels would be defined as a change likely to cause damage to surrounding property. In the case of the proposed excavation, contract documents should specify that it be carried out in a manner to avoid adverse changes in groundwater levels and a monitoring system should be established with observations on a regular basis. If an adverse effect is noted, groundwater recharge may be necessary. Under the provisions of Section 1300 (Excavation) of the Commonwealth of Massachusetts State Building Code, the person who causes an excavation to be made has the responsibility of surveillance on adjoining property and the protection of that property against damage.

In addition, it should be noted that the removal of the present paved surfaces and buildings on the site and exposure of the underlying substrata can result in an increase of storm water infiltration. After large storm events, water will collect in the depressed area of the excavation and will need to be removed, by pumping into the City's storm sewer system.

Caisson, pilings, and spread-foot foundations most likely will be used for the Lafayette Place complex and the underground parking garage. The use of these foundations is compatible with the existing sub-soil conditions found on the project site (caissons and spread-foot foundations were used in the construction of the new Jordan Marsh building). Foundation design depends on a variety of factors, including the number of stories, structural system, building load, and subsurface conditions such as the strength and compressibility of the existing sand/clay complex. The hotel tower is expected to require deep piles or piers extending into the glacial till or bedrock. However, it should be noted that since the net load of the tower will be adjusted by the three levels of the underground garage, achieving, in effect, a "floatation" of the structure, a concrete mat foundation bearing in the sand/clay complex might be satisfactorily substituted for deep piles or piers. Further engineering investigation will be required before any decision can be made.

The effects of driving piles through Boston Blue Clay have been observed over the past few years, and it is now known that this disturbance will cause settlement some distance away from the pile location, depending on the number and type of piles driven. Any future pile driving on the site, therefore, should evaluate and attempt to minimize the amount of disturbance and resultant area subsidence.

Since the underground parking garage and loading area will be below existing groundwater levels, special attention will be required to construction methods which will not adversely affect groundwater levels beneath adjacent properties. Moreover, heavy construction to resist water pressures and waterproofing will be necessary. To compensate for the uplift pressure of the groundwater, a screened stone and porous pipe drainage system is expected to be used. In addition, an automotic pumping system will be installed for emergency use should, for any reason, the groundwater level rise above an acceptable level.

The design of all areas to be located below groundwater levels must be based on the criterion that there be no adverse change in water levels beneath adjacent property. The question of what effects development might have on neighboring property is extremely complex, principally because the answer depends not only on design but also on execution. However, the technology and experience do exist to make such effects negligible. In order to ensure this, a thorough investigation and analysis of soil and groundwater conditions at and around the site will be required, the design will have to adhere faithfully to the results of such study, and, finally, strict control will have to be exercised over construction procedures.

Earthquake design provisions are contained in Section 718 of the State Building Code, the requirements of which establish the lateral earthquake forces as a function of the type and weight of the structure and are independent of geologic considerations. The Code prescribes that all structures, except detached one and two family dwellings and minor accessory buildings shall be capable of safely withstanding stresses produced by lateral forces from any horizontal direction.

Although an MBTA tunnel is located in Washington Street, adjacent to the property line of the project, no special or unusual construction techniques, other than the usual precautionary measures, are anticipated to be necessary to protect the tunnel during the demolition, excavation, or foundation phases of the project. The construction activities will be similar to those involved in the erection of the new Jordan Marsh facility adjacent to the project site, which did not require any special measures. All construction phase activities in the vicinity of this tunnel will have to be closely coordinated with the MBTA in order to ensure that no damage is caused to the tunnel structure. The existance of the MBTA easement is not expected to limit the construction of the underground garage in any significant way.

3. Natural Resources and Climatic Conditions

a. Description of Existing Conditions

Vegetation and Wildlife Resources

At present, the intensely urbanized Lafayette Place project site is either paved in asphalt for parking areas, occupied by buildings, or covered with stone chips. The site, therefore, does not contain any vegetative species of any kind.

The project area also does not support any significant wildlife resources. Dominant species of wildlife which presently inhabit the site include the pigeon (Columba Livia) and probably the norway rat (Pattus norvegicus). These species have developed a high degree of tolerance to the urban environment. The norway rat, in particular, is considered a health hazard, while the pigeon acts as a scavenger and is considered by many as a pest species.

Natural Features

Since the project site and immediate environs have been a built-up urban area since the 17th century, there exist no valuable, unique, or fragile natural resources. The closest natural area to the site is the Boston Common, some 600 feet to the west, and completely separated from the site by blocks of retail and commercial buildings.

Climatic Conditions

The project site is located in the Boston Basin approximately 4 miles inland of Massachusetts Bay. In general, the macroclimate of the site can best be described by the following National Oceanic and Atmospheric Administration summary of Boston's climate.

> "Climate is the composite of numerous weather elements. Three important influences are responsible for the main features of Boston's climate. First, the latitude (42 degrees N) places the city in the zone of prevailing west to east atmospheric flow in which are encompassed the northward and southward movements of large bodies of air from tropical and polar regions. This results in variety and changeability of the weather elements. Secondly, Boston is situated on or near several tracks frequently followed by systems of low air pressure. The consequent fluctuations from fair to cloudy or stormy conditions reinforce the influence of the first factor, while also assuring a rather dependable precipitation supply. The third factor, Boston's east-coast location, is a moderating factor effecting temperature extremes of winter and summer."[1]

---

[1] U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, "Local Climatological Data, Boston, Massachusetts", 1973.

The mean annual air temperature for Boston is 50.3 degrees F. Monthly averages range from 28.8 degrees F in January to 72.5 degrees F in July. Daily temperature extremes range from occassional highs slightly in excess of 100 degrees F to infrequent lows below -20 degrees F.

Diurnal variations of temperature in Boston in the summer months are frequently influenced by cool sea breezes. However, this cooling effect lessens as it extends inland. The urban character of the project area causes temperatures to be slightly higher than in the suburban areas around the City. The artificial brick and concrete surfaces retain more heat during the day than natural surfaces, and radiate the heat back into the atmosphere more slowly at night. In winter, under appropriate conditions, the severity of the cold waves is reduced by the nearness of the then relatively warm water.

Boston has no distinct dry season. Annual precipitation averages 40 to 45 inches with 3 to 4 inches falling every month. Winter precipitation, including rain, sleet, and snow, is generally associated with cyclonic centers passing from the northwest. Summer precipitation, mainly showers and thunderstorms, is generally frontal in character. Coastal storms from the northeast are prolific producers of rain or snow, and coastal storms of tropical origin occassionally move up the Atlantic seaboard in the late summer and early autumn months and can attain hurricane intensity in this region.

Boston lies in the zone of prevailing westerly winds. The annual wind rose for Boston shows that it experiences winds from southwest through northwest about half of the year, and that winds from the southeast are least frequent, occuring only about 2.5% of the year. Average monthly wind speeds range from about 10.9 m.p.h. in July and August to about 14.4 m.p.h. in January and February. However, winds of 32 m.p.h. or higher may be expected at least one day each month, and gales are both more common and more severe in the winter months.

Significantly damaging weather is not frequent in the Boston area, particularly for inland locations as the project site. The most damaging natural element in this area (apart from the ocean) is high winds. However, their destruction is normally limited to trees, street furniture, and other relatively minor surficial features in areas away from the coast.

b. Impact of the Proposed Project

Vegetation and Wildlife Resources

Due to the lack of any vegetation in the area, there will be no adverse impact on vegetative resources with implementation of the project. Rather, there will be some beneficial impacts since landscaping of public plaza areas and the retail mall are planned as part of the project.

There will be no significant adverse or beneficial impacts on the avian wildlife resources in the project area. The existing species will be disturbed, but since it is adaptable it will move to other areas in the vicinity which are not being disturbed.

Demolition of the existing buildings on the site and excavation activities could have the adverse impact of causing the migration of rats, which most likely are present in the vacant structures. Prior to demolition or disturbance, a carefully planned rodent extermination program should be conducted to minimize the adverse impact.

Natural Features

The proposed project will not result in any impact, beneficial or adverse, on any natural resource or feature.

Climatic Conditions

The project will not have any impact on the macroclimate of the Boston region. There will, however, be some effects on microclimate conditions at the project site. Covering the site with buildings will continue the urban "heat island" effect, but this is not deemed significant. The proposal for a high-rise hotel tower could cause some localized wind problems, depending on its design; this impact is discussed in greater detail in Section 9.

4. Transportation Network

The Lafayette Place project site has an excellent location in the retail core of downtown Boston, ideally situated with respect to automobile, mass transit, and pedestrian access. The existing transportation network is extensive, and proposed pedestrian improvements for the central business district will accentuate this asset. Today, over 1.3 million trips are made to and within this small but intensely developed downtown area each day via automobiles, buses, and the subway.

The Boston metropolitan area is served by a regional transportation system of core-oriented radial highways and public transit. In 1972, cordon counts by the City of Boston indicated that 884,000 persons entered and left the core area (Boston Proper) by all modes on an average day, 7 A.M. to 12 midnight. The number of people entering during the morning peak hours (8 A.M. to 9 A.M.) was approximately 115,000 and the number leaving during the evening peak hour (4:30 P.M. to 5:30 P.M.) was approximately 145,000. Fifty-three percent of the morning trips and fifty percent of the evening trips were made by public transit. However, a Wilbur Smith study in 1972 indicated that about 60% of the total day-time population used public transit to enter the city core area. This extensive use of transit can be explained by the fact that conditions in the city core (intense development and congestion) tend to encourage the use of transit. It should be noted, on the other hand, that trends in the past decades have shown a continually decreasing use of public transit and, if present trends continue, the modal split by 1980 could be 55% transit and 45% auto (see Figure II.A.10).

With respect to expressway and automobile access, Lafayette Place is centered among the five major facilities serving the downtown area - the Massachusetts Turnpike, Storrow Drive, Interstate 93/ Mystic River Bridge, the Sumner and Callahan Tunnels, and the Southwest Expressway (see figure II.A.11). The majority of the Lafayette Place automobile trips from outside the city will enter the downtown on one of these routes.

Major local streets serving the project area are Washington Street (northbound), Tremont and Chauncy Streets (southbound), Summer-Winter and Kneeland Streets (westbound), and Boylston-Essex Streets (eastbound). Anticipated adjustments in the downtown's traffic circulation pattern, due to implementation of the City's Transit and Traffic Improvement Program (TTIP), described below, will result in some changes to the site's access by public streets.

Lafayette Place is readily accessible to public transit, with four stations in close proximity to the project site - the Washington, Essex, Park, and Boylston stations on the Red, Orange and Green Lines of the Massachusetts Bay Transportation Authority (MBTA).

Figure II.A.10.a

NUMBER OF PEAK PERSON TRIPS BY MODE

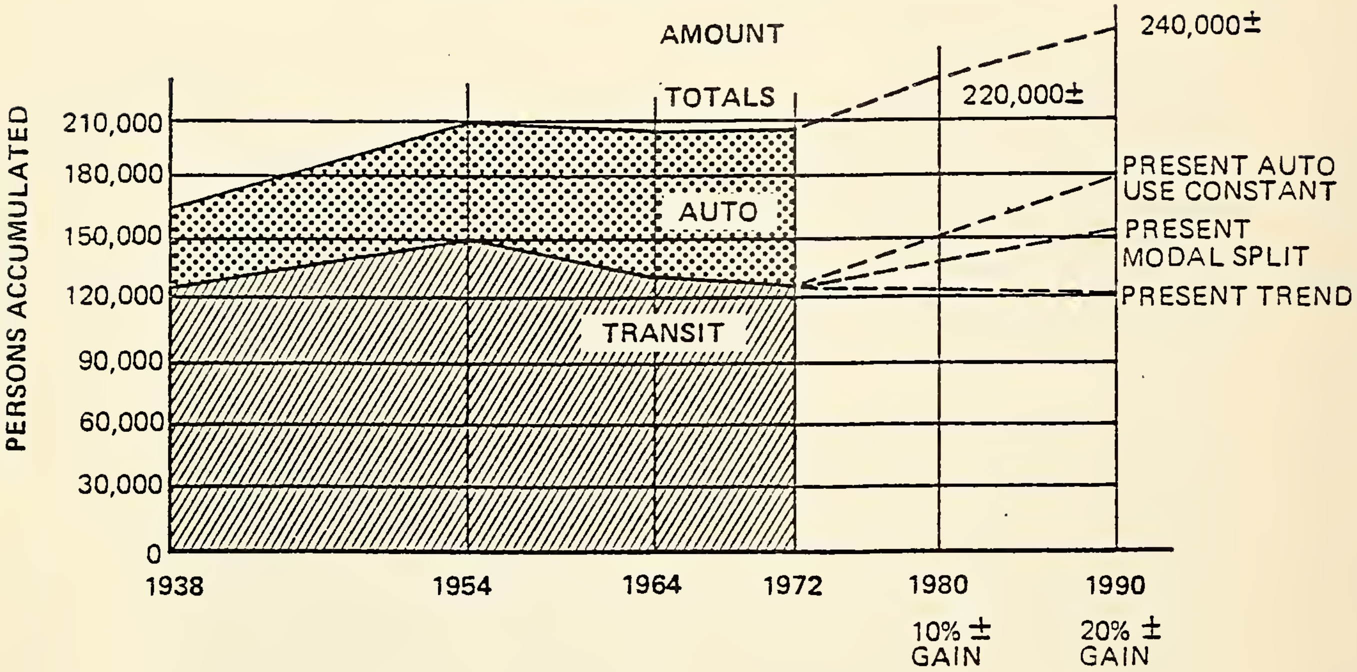
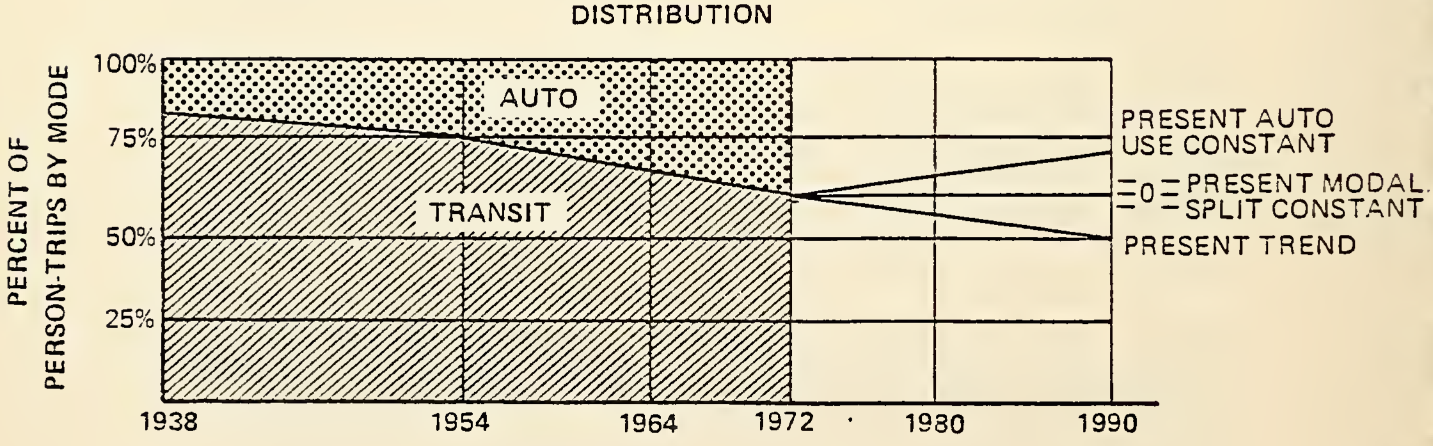
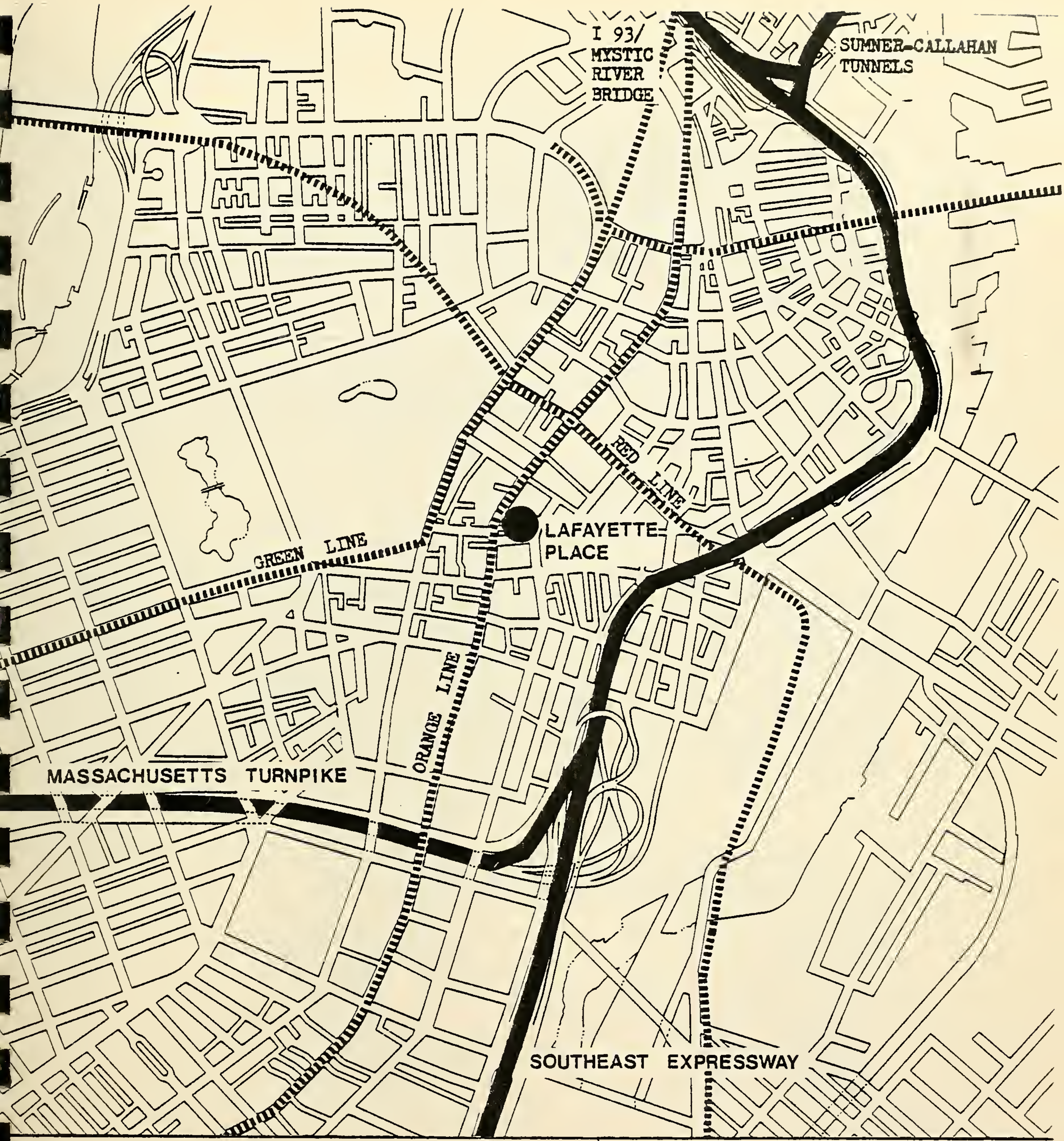


Figure II.A.10.b

PERCENT OF PEAK PERSON TRIPS BY MODE



SOURCE: Wilbur Smith and Associates, Boston Parking Study, November, 1972



LAFAYETTE PLACE PROJECT ●
EXPRESSWAY ▬
RAPID TRANSIT LINE ▥

LAFAYETTE PLACE

HIGHWAY AND
RAPID TRANSIT ACCESS

Figure II.A.11

BOSTON REDEVELOPMENT AUTHORITY

In addition, the site is served by four commuter express buses with a stop at Summer and Chauncy Streets. Bus service will greatly expand under the TTIP project. Within a ten minute walk is the South Station commuter rail terminal, which is planned for upgrading as a major transportation center. Direct subway connections are also possible via the Orange and Green Lines with Boston and Main commuter rail at North Station and via the Blue Line with Logan International Airport.

Because of the project site's location relative to the Beacon Hill, Back Bay, and South Cove residential neighborhoods, and to the downtown commercial center, walking will be convenient from each of these areas. It can be expected therefore, that a higher than normal percentage of both shopping and visitor trips to Lafayette Place would be pedestrian.

a. Description of Existing Conditions

Regional Transportation Network

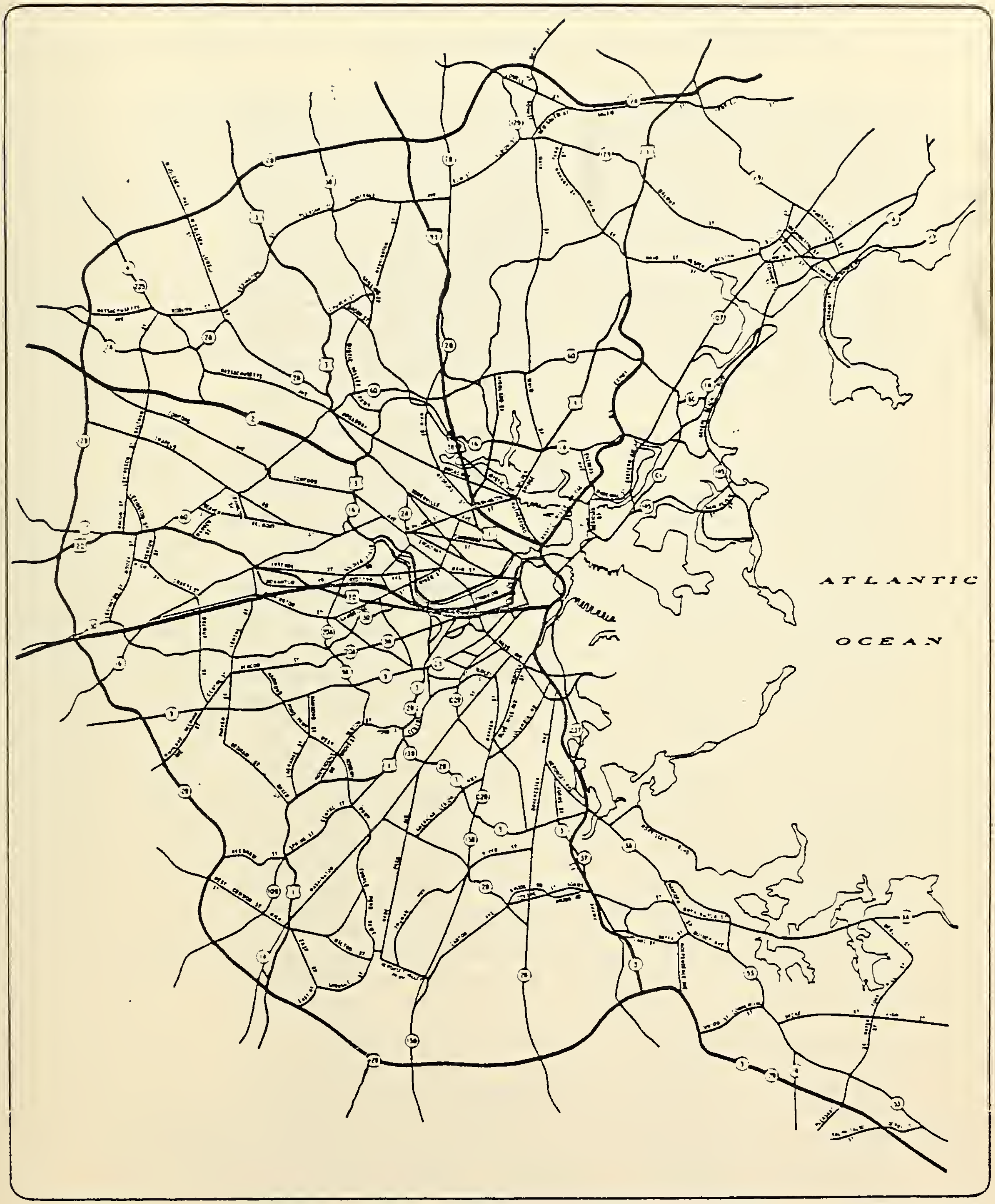
The regional highway network can be characterized as a system of radial highways which feed into the central core of Boston from the northeast (Route 1/I-95, north (I-93), northwest (Route 2), west (Massachusetts Turnpike), southwest (Route 1), and Southwest (I-95/Southeast Expressway). The major approaches to the downtown core from these highways are the Mystic River Bridge, the Sumner and Callahan Tunnels, Storrow Drive, the Massachusetts Turnpike Extension and the Central Artery. Estimated average daily traffic flows on these expressways, from a 1974 cordon count for downtown Boston, are as follows:

Table II.A.3

Estimated 1974 Average Daily Traffic Volumes
Regional Expressway Access to Downtown Boston

Roadway	24-Hour Volume
Storrow Drive	87,768
Massachusetts Turnpike Extension	69,865
Southeast Expressway	140,391
Callahan Tunnel	37,695
Sumner Tunnel	39,637
Fitzgerald Expressway	124,247

At the present time the expressway system serving central Boston has adequate capacity during the off-peak hours, but these routes are heavily congested during both the morning and evening rush hours. In several cases, there are isolated points of stop-and-go conditions, such as the Mystic River Bridge and the merger of



1977 Highway Network Inside Route 128

Figure: II.A.12

I-93 with the Central Artery. The effect of this condition in the morning is that the congestion points serve to control or meter the flow of vehicles onto the local street system, spreading the peak flows over time and reducing congestion on the local streets. Also, drivers themselves vary their travel times to avoid periods that are likely to be heavily congested, again resulting in a spreading of the peak and a lessening of local street flows. A similar effect exists in the evening, although of course the expressways can no longer serve as metering devices for vehicles flowing onto the local street system. Still, there are points of heavy daily congestion on the expressway ramps and bridge approaches which lengthen the evening peak by changing departure times.

Since several of the major access expressways are presently flowing at or near capacity, they serve to limit auto traffic entering the downtown local street system. Without major expansion of the expressway system, which is not probable under the current highway moratorium, it is likely that traffic on the local street system will increase at a slower rate than it would if the expressways were not already congested. In the past, growth in traffic destined to the CBD has been handled by providing increased highway facilities. Interstate 93, the Callahan Tunnel, and the Massachusetts Turnpike are examples of facilities which have been added in recent years to increase highway capacity. Now, with the highway moratorium, the total expressway capacity has finite limits, and new traffic has accommodated itself by a lengthening of the peak period (see Figure II.A.13).

The Lafayette Place project site, being located approximately 800 feet west of the Central Artery and one-half miles from the intersection of the Turnpike Extension and the Southeast Expressway, has excellent access to all parts of the metropolitan area via connecting highways. There are a number of expressway ramps in the vicinity of Lafayette Place. For traffic moving to and from the north, the most important are the South Street on-ramp and the Beach Street off-ramp. The corresponding ramps for traffic moving to and from the south and west are located along the south side of Kneeland Street at the Surface Artery and Lincoln and South Streets.

Local Street Network

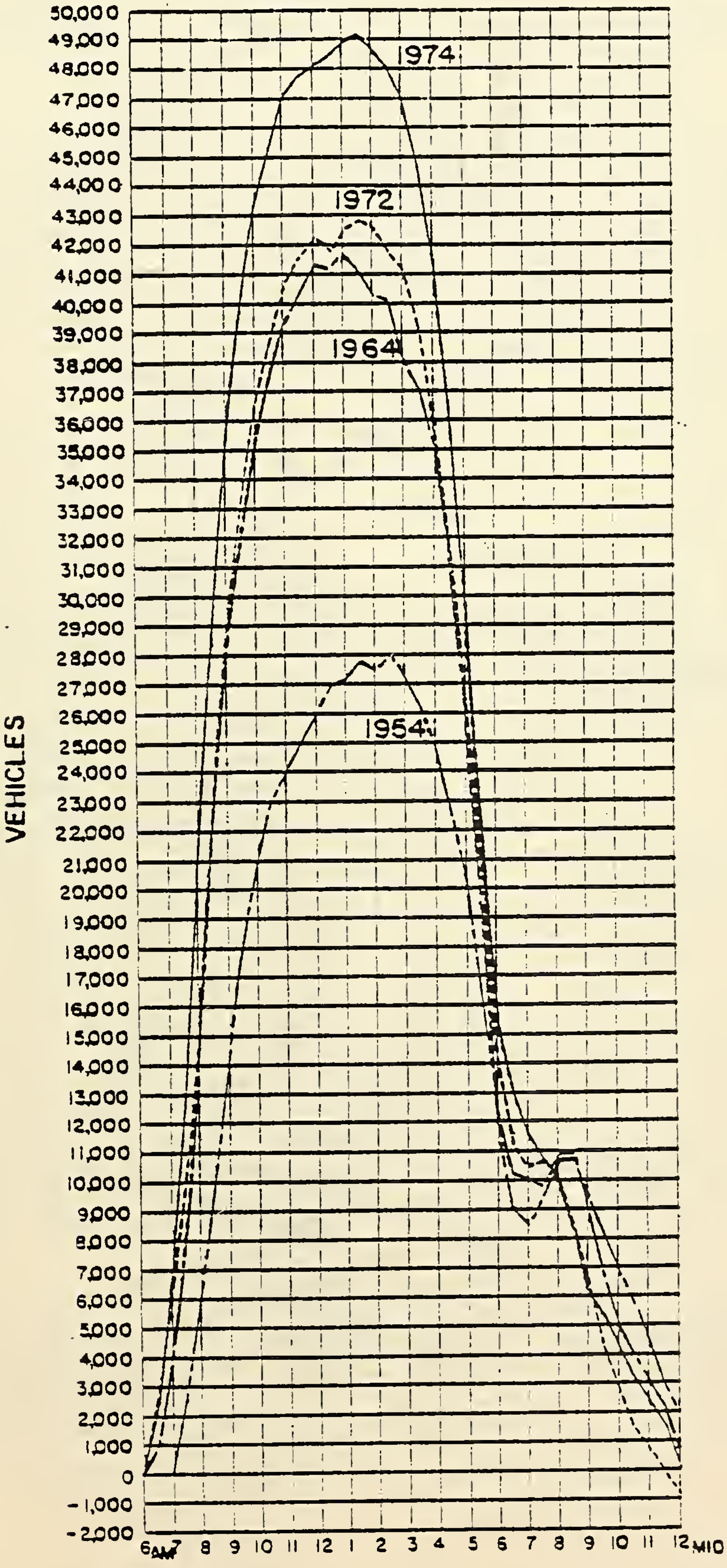
The principal north-south surface streets in the vicinity of Lafayette Place are Tremont, Washington, Chauncy, and Kingston Streets. The Surface Artery, involved in the alignment of the Central Artery, functions more as an element of the expressway rather than of the local circulation system associated with the project, as do Lincoln and South Streets, which connect to the expressway ramps (see Figure II.A.14).

Of these streets, Tremont Street is one-way southbound, Washington Street is northbound, and Chauncy and Kingston

Figure II.A.13: COMPARISION 1954, 1964, 1972, & 1974

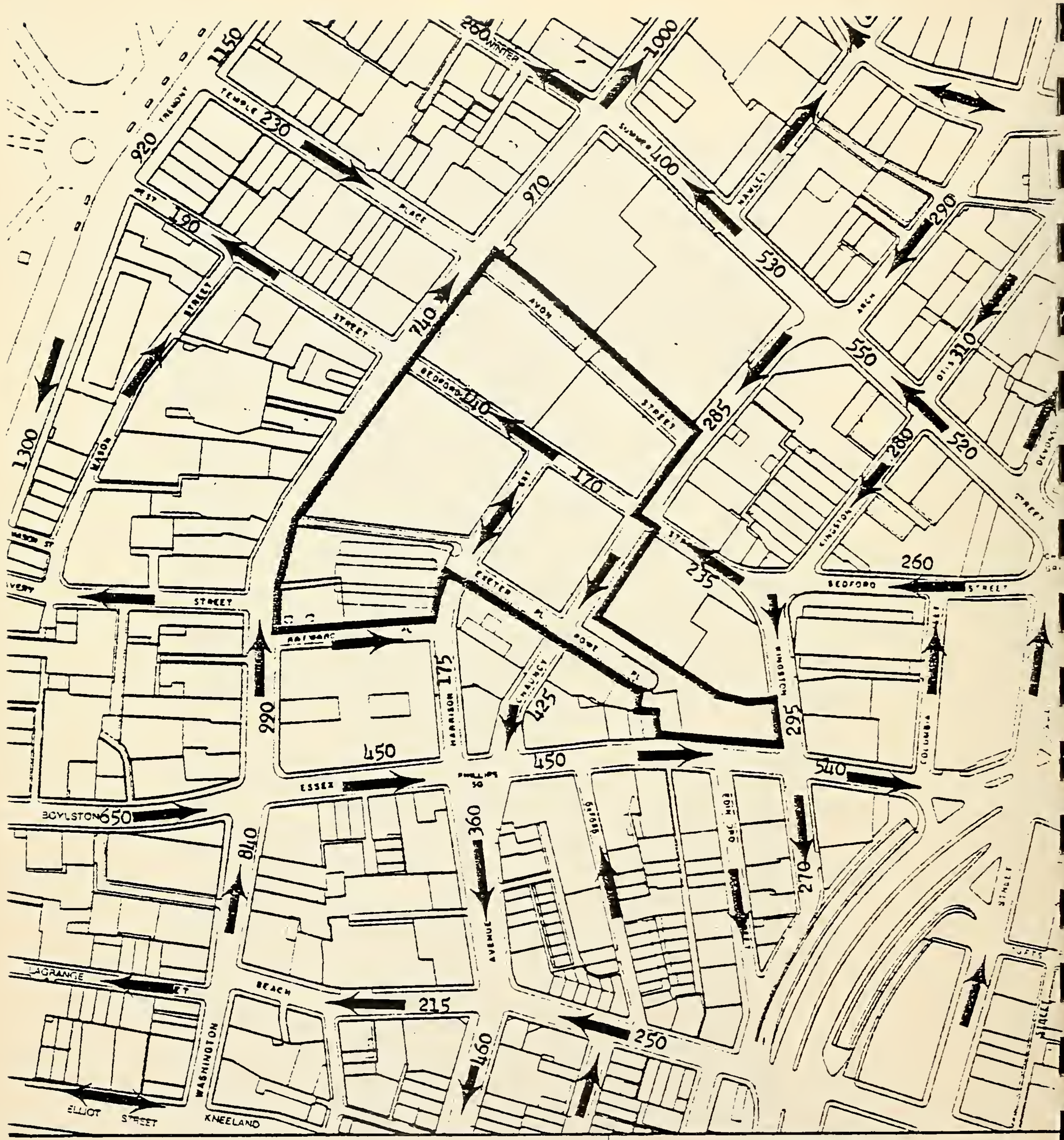
ACCUMULATION OF VEHICLES ENTERING & LEAVING STUDY AREA

6:00AM TO 12:00MID



HOURS

Source: Cordon Count, Downtown Boston, 1974, Boston Traffic and Parking Department



0 200 400 FEET

LAFAYETTE PLACE

EXISTING TRAFFIC FLOW
DIRECTIONS AND P.M.
PEAK-HOUR VOLUMES
(4:30-5:30)

Figure II.A.14

BOSTON REDEVELOPMENT AUTHORITY

are very narrow and become extremely congested with parked cars and service vehicles. Of these streets, Avery Street is probably affected least by land service activity.

Summer Street is one-way westbound passing along the north side of the Jordan Marsh Store. Summer Street traffic divides approximately equally at Washington Street, with about one-half turning to the north and the other half continuing through on Winter Street. Currently, most of the central area streets are encumbered by the loading and unloading operations of service vehicles. The absence of commercial service vehicle facilities increases the overall congestion on streets that are already deficient in width in downtown Boston. The situation is intensified by illegally parked vehicles along the major streets, particularly during rush hour.

Existing peak hour and daily traffic volumes on the local streets in the vicinity of the Lafayette Place project area are indicated on Table II.A.4.

Public Transportation

The proposed Lafayette Place project is situated near the junction of two important subway lines - the Orange Line under Washington Street serving the northern and southwestern parts of the Boston area, from Malden to Forest Hills, and the Red Line under Summer Street, running from Harvard Square in the west to Quincy and Ashmont (Dorchester) on the south (see Figure II.A.15). The Washington Street Station at this junction is less than a five minute walk from the site. The Essex station on the Orange Line, at Washington and Essex Streets is located close to the south end of the project site. Also nearby and serving the project area are the Park Street and Boylston Street stations on the Green Line. In addition, four commuter express bus lines from the western suburbs have their terminal at the Jordan Marsh store at Chauncy and Summer Streets.

Although ridership on the MBTA transit system has been generally decling since the late 1940's, the system is still heavily used and either approaches or exceeds its capacity during peak periods. Capacity of the system serving the Lafayette Place project area can be limited by either line capacity or station capacity, although preliminary analysis and an examination of historical trends indicates that the limiting factor would be one or more of the individual lines rather than the stations.

Recent one-way station volumes of the four stations serving the project area are indicated on Table II.A.5. Peak hour volumes range from 14% for the Green Line to 27% for the Red and Orange Lines. Since current volumes are considerably below volumes handled in earlier years, a rough measure of excess station capacity may be inferred. Current carrying capacities of the four transit lines are indicated on Table II.A.6.

Table II.A.4

Existing Traffic Volumes
Lafayette Place Project Vicinity

Street Segment	Traffic Volumes[1] 24-Hour	Traffic Volumes[1] P.M. Peak Hour	No. Travel Lanes[2]
WASHINGTON (NB)			
Essex-West	13,913	990	1
West-Temple	10,924	740	1
Temple-Summer	10,693	970	2
HARRISON (SB)			
Beech-Essex	10,253	360	2
Essex-Bedford	1,857	175	1
CHAUNCY (SB)			
Essex-Bedford	4,883	425	1
Bedford-Summer	4,178	285	1
KINGSTON (SB)			
Essex-Bedford	3,875	295	2
Bedford-Summer	2,746	280	1
BOYLSTON/ESSEX (EB)			
Tremont-Washington	10,852	650	2
Washington-Harrison	7,750	450	1
Harrison-Kingston	7,936	450	1
Kingston-Surface Artery	8,004	540	2
HAYWARD PL. (EB)			
Washington-Harrison	1,397	32	1
AVERY (WB)			
Tremont-Washington	1,592	107	1
WEST/BEDFORD (WB)			
Tremont-Washington	3,653	190	1
Washington-Chauncy	1,876	140	1
Chauncy-Kingston	3,332	235	1
TEMPLE PL. (EB)			
Tremont-Washington	3,135	230	1
SUMMER (WB)			
Washington-Arch	5,517	400	2
Arch-Otis	7,812	550	2

1 Data based on 11-hour traffic counts, 1971-1977, furnished by Boston Redevelopment Authority, Transportation Planning Department, and City of Boston Traffic and Parking Department.

2 Based on field survey of actual use taken by BRA January, 1978. Lanes blocked by illegally parked cars were not considered travel lanes.

Table II.A.5

Approximate 24-Hour 1-Way MBTA Station Volumes Near Lafayette Place Project Area

	Station			
Date	Orange	Red	Green	
	Essex	Washington	Park	Boylston
1964	9,200	45,900	28,700	6,800
1970	6,265	45,032	30,218	6,411
1972	6,429	40,500	25,107	6,117
1974	5,834	37,332	24,161	7,541
1976*	4,330	33,854	23,595	4,709
% Change (70-76)	-31%	-25%	-22%	-26%

*Does not include holders of pre-paid passes (14,482)

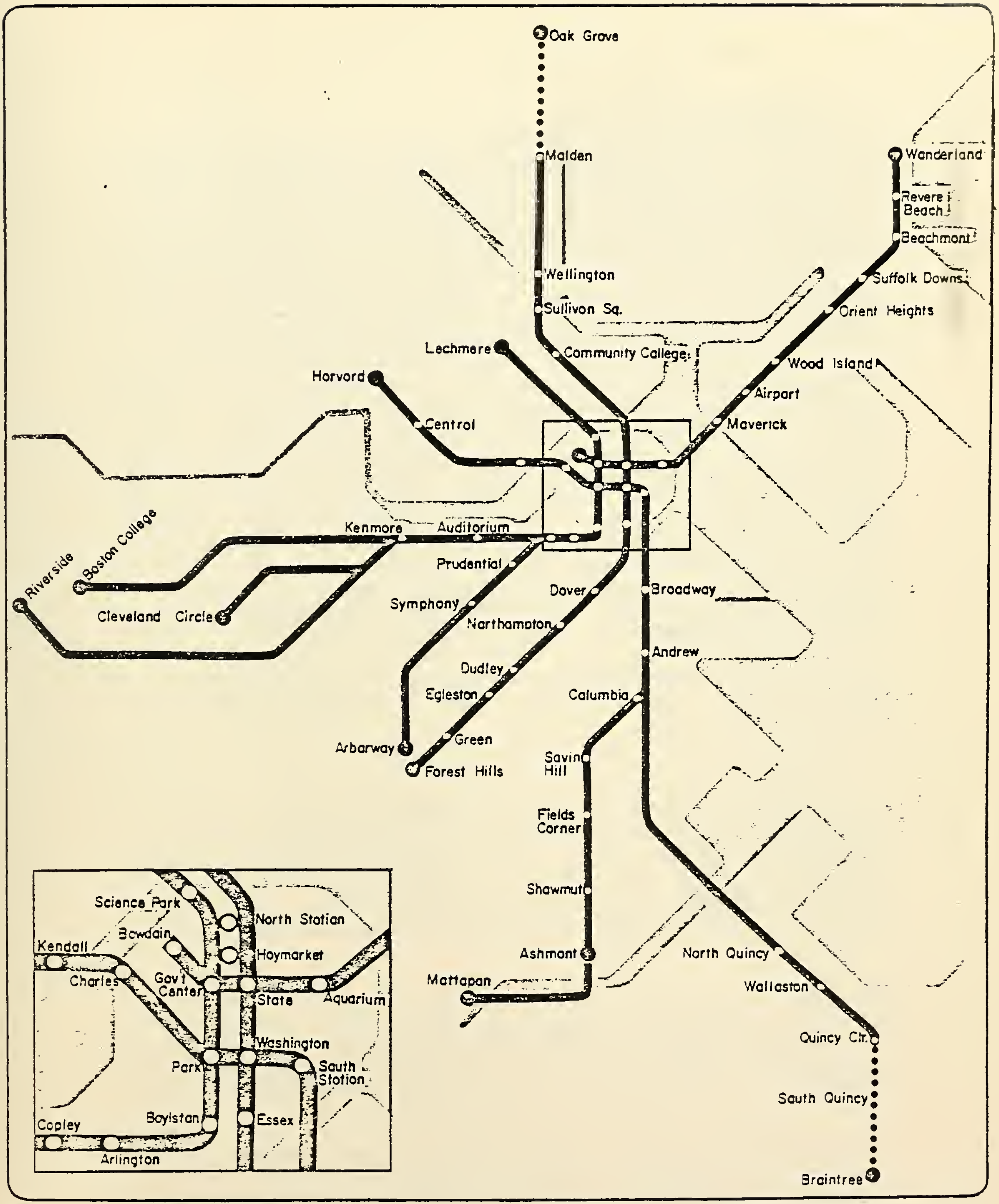
Source: Massachusetts Bay Transportation Authority, one-way traffic admitted at subway entrances, December 4, 5, 6, or 8.

Table II.A.6

Carrying Capacity of the MBTA Transit System

Capacity	Red Line	Orange Line	Blue Line	Green Line
Current headway	2½ min.	3½ min.	3½ min.	
Current operating carrying capacity (riders)	17,136	10,148	7,888	11,115
Estimated capacity @				
6-cars, current headway	25,704	15,096	11,832	
4-cars, 2 min. headway	21,420	17,760	13,920	
6-cars, 2 min. headway	32,130	26,640	20,880	
72-2 car LRV trains/hr.				23,760
Current maximum peak hour volume (1972)	15,703	10,320	8,365	10,918
Percent of peak hour volume to carrying capacity	92%	103%	106%	98%
No. transit cars owned	164	100	67	241
No. currently scheduled	104	76	48	-

Source: Executive Office of Transportation and Construction (Massachusetts), Technical Supplement to the Program for Mass Transportation, Vol. II: Existing Plant and Facilities, April 1977 (draft)



1977 Rapid Transit Network

no scale

Figure: II.A.15

(1) Orange Line

The Orange Line is a high-platform, rapid transit subway/elevated system with a current (1972) peak volume (A.M. northbound) of 10,320 passengers/hour/direction. The currently operated carrying capacity is 10,148 passengers/hour/direction, with 4-car trains running approximately every 3.5 minutes. The scheduled capacity is based upon 148 passengers per car maximum, giving each standee 2.5 square feet of floor space. At current operating conditions, therefore, the line is running at 102% of carrying capacity during the peak hours, with the extra load absorbed by crush loading.

The MBTA has begun construction for the relocation of the elevated alignment along Washington Street south of the project area to the mainline Penn-Central right-of-way in the Southwest Corridor, a project which is scheduled to be completed in the mid-1980's. This new Orange Line is expected to attract additional riders, including present riders from the Green Line, which would help accommodate both line haul and downtown distribution needs. In addition, the MBTA is expanding all stations on the Orange Line to accommodate 6-car trains. If at the same time headways are reduced to 2 minutes, potential capacity of the line could increase to 26,640 passengers/hour/direction, resulting in an excess capacity of 61% with current volumes.

The Orange Line presently has 100 vehicles, with 76 needed for current service. New vehicles in order for this line will also improve its capacity.

(2) Red Line

The present capacity of the Red Line is 17,136 passengers per hour based on a 2.5 minute headway (5 minutes each for Ashmont and Quincy) and four-car trains. Maximum peak-hour volume is estimated at 15,703, resulting in the line operating at 92% of its presently operated carrying capacity. However, during the peak/ 15 minutes of the rush hour, the system operates at 128% of its capacity with crush loading conditions.

The Red Line currently has 164 vehicles (88 "bluebirds" with a capacity of 200 riders per car @ 2.5 square feet per standee, and 76 "silverbirds" with a capacity of 151 persons per car); 104 are in service at one time with 10% reserved for backup and repair cycles. On off-peak periods, two-car trains are operated on the line.

With station improvements to accommodate six-car trains and by reducing the headway to two minuntes, carrying capacity could be increased to 37,530 passengers/hour/direction. At estimated 1980 ridership, the Red Line could then operate at 55% capacity at peak hour and at 77% capacity during the peak 15 minutes.

(3) Green Line

The Green Line serves as both a high density collection/distribution for the downtown and a suburban line-haul facility. It currently operates 39 trains per hour outbound towards Copley in the P.M. peak at Park Street Station, with train lengths of 2-3 cars. At 130 passengers per car fully loaded, the MBTA estimates peak hour carrying capacity of 11,115 passenger/hour with an average train length of 2.19 cars. The line presently operates some 240 vehicles.

The highest 1972 count (A.M. inbound) was 10,918; therefore the Green Line was operating at 98% of its carrying capacity; and at 122% during the peak-15 minute period (based on a 31% peaking factor). With vehicle and operating improvements, potential capacity is estimated at 23,760 passengers per hour.

Current problems on the Green Line result from an insufficient fleet of cars, unreliable frequency of service, unreliability of the PCC cars, and long station dwell times caused by the number and poor location of the car doors. Because four Green Line surface routes converge in the central tunnel with no systematic scheduling, bunching of cars and poor schedule reliability occur. In contrast, the 1947 headways were from 36 to 40 seconds with one car trains and yielded a capacity of about 18,000 passengers per hour per direction at Arlington Station. However, there were also more vehicles in service at that time and they were in considerably better running condition.

A major improvement program is presently underway to upgrade service and capacity in the Green Line central subway system and to correct current problems. Among the improvements is the delivery to the system of 175 new light-rail transit vehicles (LRV), scheduled for 1977 and 1978, to replace most of the existing PCC cars. Each of the new vehicles has a maximum passenger load of 220 person, compared to 130 on the present PCC cars. Additional power substations will be constructed to provide electricity to handle increased acceleration, speed, and air conditioning.

(4) Blue Line

Although the Blue Line (Bowdoin Street to Wonderland) does not directly serve the Lafayette Place project area, it does serve the northeast corridor and can be expected to be utilized by some employees and patrons of the project via transfer from the Orange Line. The current scheduled capacity on the Blue Line is 7,888 passengers/hour at a 4 minute headway in the A.M. peak and 3.5 minute headway in the P.M. peak. Present maximum volume is 8,365 passengers (P.M. peak, outbound), resulting in a current load of 105% of capacity. Maximum existing potential capacity (4-car trains @ 2-minute headway) is 13,920 passengers, which would adequately serve estimated 1980 maximum volume of 8,672 passengers/hour.

The Blue Line has 67 cars (capacity of 116 passengers), with 48 vehicles in operation at one time.

Future MBTA transit capacities, based on various assumptions of car length and headway are indicated on Table II.A.7.

Bus Service

At the present time, four suburban express bus routes serve the project area - 300 (Riverside), 301 (Brighton), 304 (Watertown), and 305 (Waltham). The downtown terminal is at Chauncy and Summer Streets, behind the Jordan Marsh store. Current daily two-way ridership on the four lines totals approximately 11,000 person-trips.

The nearest local bus service is Route 43 (Egleston-Stuart) which travels along Tremont Street one block from the project area, and Route 49 (Northampton-Kneeland), which connects to the Essex Street subway station. South Boston routes (6 and 7), a North Station-South Station loop, and a Haymarket connector (Route 3) stop at South Station.

Under the TTIP proposal, a significant expansion of local bus service will be provided to the retail core area from the Boston neighborhoods. This service will include Routes 43 and 49 from the South End/Roxbury areas, which will transverse Washington Street, Route 7 and 11 from South Boston, along Summer and Chauncy Streets, and Routes 92 and 93 from Charlestown, operating on Chauncy-Bedford-Washington Streets. The increased penetration into the downtown will result in a greater accessibility for city residents. This, along with improved service due to exclusive bus lanes and reduced delays and congestion, is expected to lead to a 15% increase in ridership. (A 3% rise in transit ridership is also anticipated.)

Commuter Rail Service

Boston is served by two separate commuter rail systems, (Figure II.A.16), both of which are operated by the MBTA. The Penn-Central to the south and west operates 12 trains inbound in the morning and 11 outbound in the afternoon at South Station. Service is generally limited to 1 or 2 trains per line per period except for the Needham Heights branch which carries 3. A 1974-75 winter passenger count showed A.M. and P.M. riderships of 4,530 and 3,637 respectively, versus available seats of 4,872 and 4,304.

The Boston and Maine serves the northern and northwestern regions of the Boston area, arriving and departing from North Station. Current Boston and Maine ridership is approximately 10,000 passengers per day. A 1972 Commuter Rail Improvement Program Report indicated a typical 1972 weekday 7:30-9:00 A.M. ridership of approximately 9,800 with a range of 60 to 106 percent of the seats occupied. The average occupancy of the four main lines was 78%.

Table II.A.7

Potential Percentage of 1980 Projected Peak Hour MBTA Passenger Volumes to Carrying Capacity[1]

	Red Line[2]	Orange Line[3]	Blue Line[4]
Estimated 1980 maximum peak hour volume	17,591	12,534	8,672
1980 volume to current operating carrying capacity	103%	124%	102%
1980 volume to capacity @			
4-car trains 2 min. headway	82%	71%	58%
6-car trains, current headway	68%	83%	68%
6-car trains, 2 min. headway	55%	47%	39%

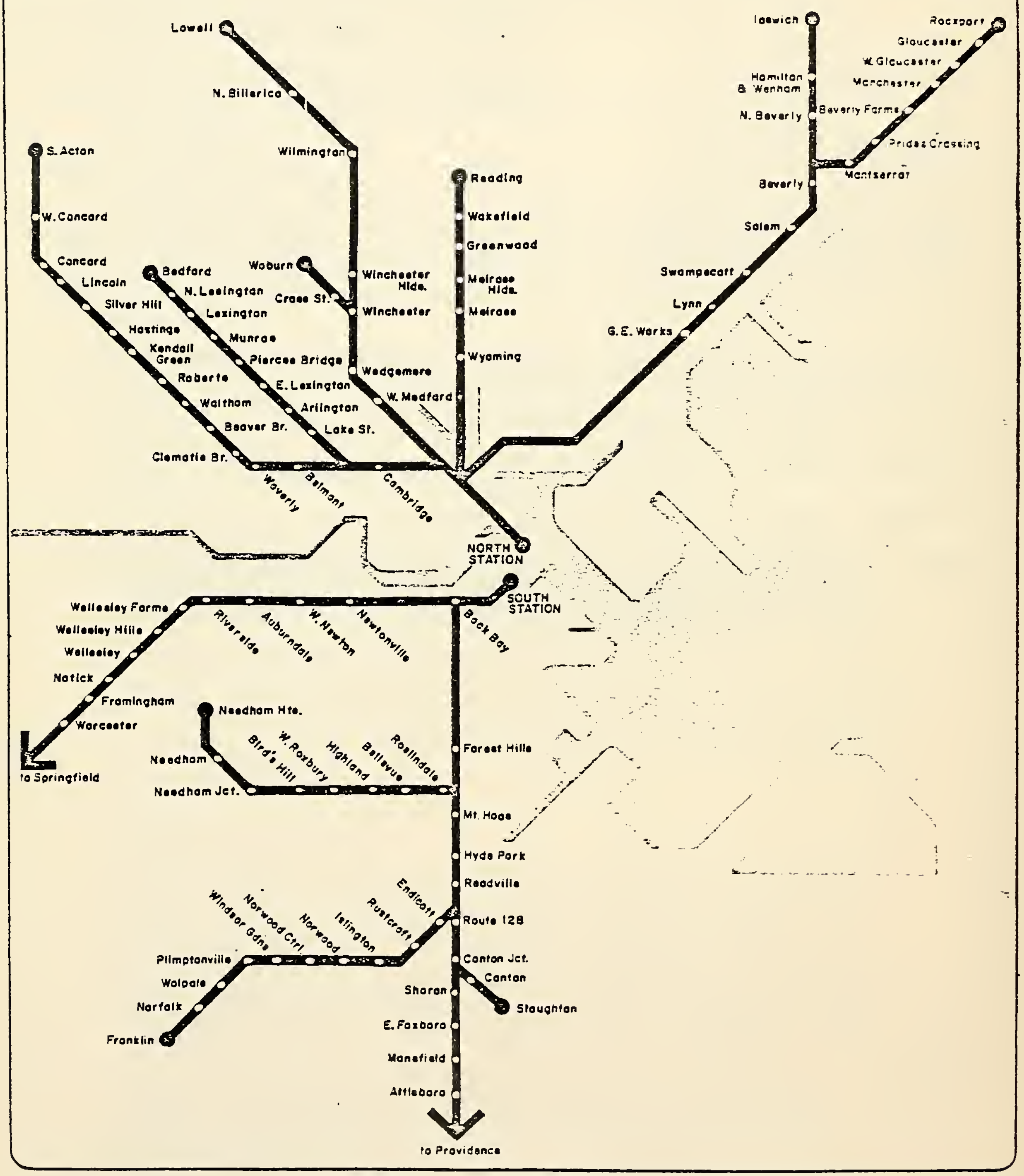
1 Does not incorporate schedule unreliability or unusual maintenance problems. Projections for Green Line not available.

2 Assumes extension to Braintree only.

3 Assumes extension to Needham, Route 128, and Oak Grove

4 Assumes extension to Central Square, Lynn

Source: Executive Office of Transportation and Construction (Massachusetts), Technical Supplement to the Program for Mass Transportatiion, Vol II; Existing Plant and Facilities, April 1977 (draft)



1977 Commuter Rail Network

no scale

Figure: II.A.16

As with the public transit system in general, both commuter rail systems have experienced a decline in ridership, showing estimated annual losses between 1966 and 1973 of approximately 3% and 1% for the Boston and Maine and Penn-Central systems respectively. At the same time, operating costs have risen rapidly, leading to sharp rises in per ride deficit.

Taxi Service

Taxi service also can be considered a public transportation resource to serve the project area. Downtown Boston is well-served by taxis, and there are an estimated 19 taxi stands in the retail core area. Stands are supplemented by service in response to telephone calls and by cruising vehicles. Although the taxi does not play a significant role in commuter travel, a BRA study of person trips to selected downtown trip generators indicated that about 2% of the trips made in an average work day are made by taxi. With the implementation of the TTIP project, greater use of taxi's might be expected in the future.

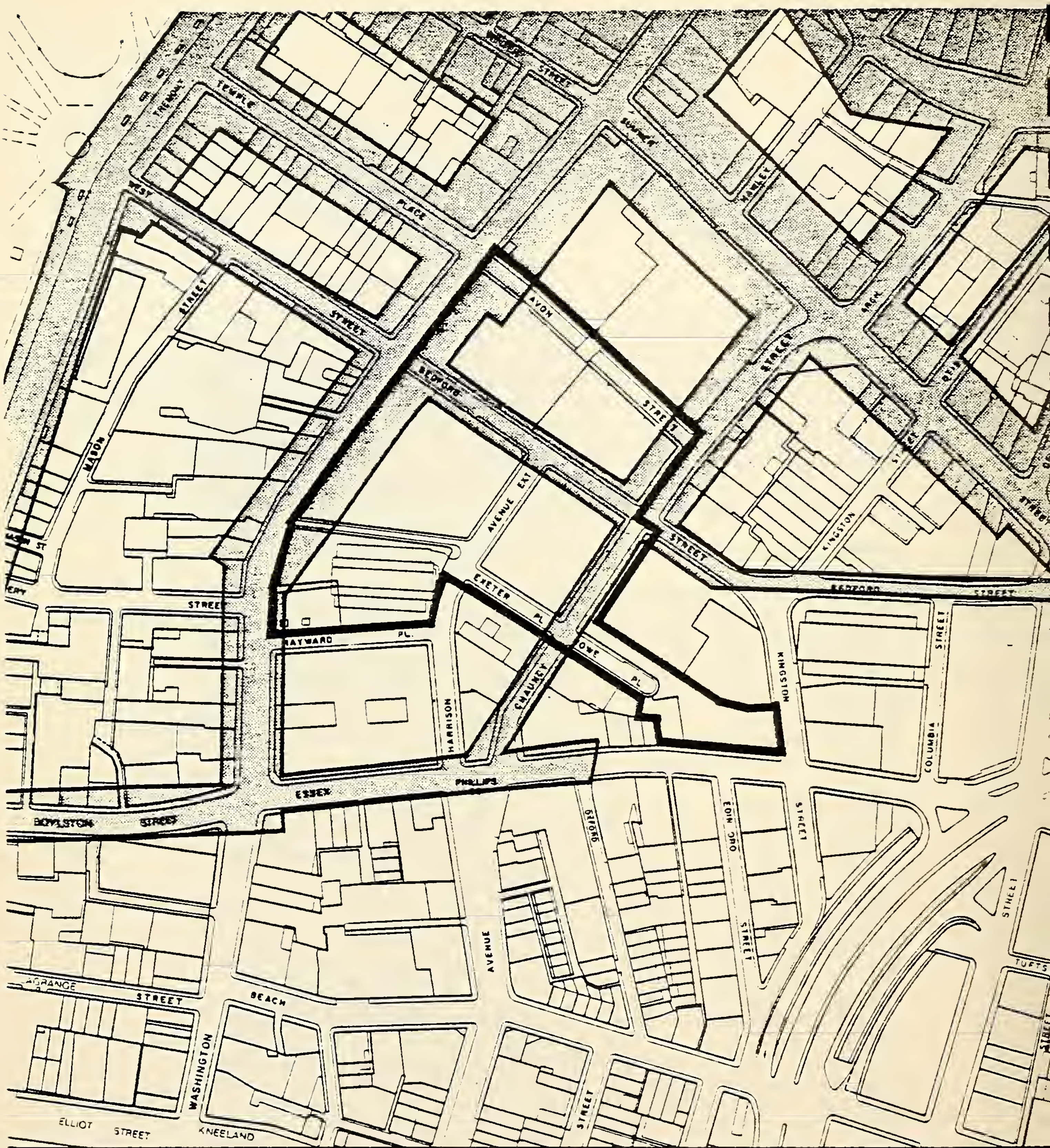
Pedestrian Circulation

Pedestrian traffic volumes in the intensely developed core area are very high, particularly along Washington Street, which is one of the principal shopping streets in the downtown and a major pedestrian link between the retail area and the entertainment district. During peak hours (e.g., 12 to 1 P.M.) pedestrian volumes on Washington Street are in the 8,000-9,000 range, and more than 1,000 pedestrians use Bedford, Essex, and Chauncy Streets during the same noon hour. A graphic illustration of downtown pedestrian volumes is indicated on Figure II.A.17.

Due to the area's narrow sidewalks (the sidewalks on Washington Street, the widest in the project area, are only 9 feet wide) congested flow is a frequent occurence and the pedestrian experience is one of conflict and confusion. As a result, pedestrian traffic often spills over into the street during busy hours, conflicting with the vehicular traffic and causing safety hazards. On major shopping streets such as Washington Street, heaviest congestion occurs during the morning and evening rush hours and lunchtime peak, although the level of pedestrian congestion rarely abates through the afternoon shopping period. Using Fruin's measure of pedestrian congestion,[1] the level of service along these streets ranges from C to E, in which conflicts between pedestrians is inevitable, physical collisions probable, crossing a reverse movement severely restricted and passing of slower pedestrians rarely possible. The amount of additional sidewalk width required to achieve level of service B ranges up to 27 feet. At the same time

---

[1] Fruin, John J., "Designing for Pedestrians - A Level of Service Concept" (PhD Dissertation), Polytechnic Institute of Brooklyn, June, 1970.



6000

3000

1500

750

One inch equals 6000 people.

0 200 400 FEET

LAFAYETTE PLACE

PEDESTRIAN VOLUMES
WEEKDAY - NOON
SEPTEMBER 1973

Figure II.A.17

BOSTON REDEVELOPMENT AUTHORITY

it should be noted that pedestrian volumes along Washington Street immediately adjacent to the project area are considerably reduced due to the vacancy of the project site and the lack of major pedestrian generators in this area.

Parking

Based on surveys by the Boston Redevelopment Authority Transportation Planning Department, the total parking supply in the immediate vicinity of the project site - within a five-minute walking distance - is estimated at 3,530 on and off-street spaces, and within a ten-minute walking distance, 6,520 spaces. On-street spaces represent legal curb parking, which can fluctuate slightly from day to day for street cleaning, and from hour to hour for peak hour parking bans. The average on-street turnover for the downtown area is 3.3 parkers per space, and the spaces are usually always occupied during the day. Off-street spaces include both public and private parking lots and garage structures, the majority of the spaces being located in garages. Most surface lots are fully occupied during the day, at least during the peak accumulation period, whereas the garages generally have excess capacity. A 1972 survey of four major garages in the immediate vicinity of the project area (2,925 car capacity) indicated a daily occupancy rate of 64%. Occupancy, however, varies greatly depending on the facility. Mechanical garages such as the Hayward Place and Kingston/Bedford garages are largely underutilized because of their inefficient mechanical operation. The Lincoln/Essex garage, on the other hand is used primarily by all-day commuters and is filled to capacity. A summary of existing garage space within a five to ten minute walking time of the project area is given on Table II.A.8.

The project site itself contains three open parking lots and a portion of a fourth, with a combined capacity of 362 spaces, and the 700 space Hayward Place garage. These parking facilities serve primarily short-term shopper trips and accommodate a total of approximately 1,498 vehicles per day. (BRA field surveys, 1972, 1975, 1978).

Parking surveys were undertaken in 1974 and involved a random sample of patrons at the Jordan Marsh store. Data collected indicate the distribution of walking trips relative to the distance parked from their destination. The analysis of the parking data indicated that 75 percent of the people were parked within a four-minute walking time of their destination; as the distance exceeded a walking time of five minutes, the percentage of people was reduced. A sharp rise in the percentage from zero to four minutes and its gradual reduction beyond the seven-minute point are perhaps indicative of the fact that a walking distance of about five minutes represents a threshold point beyond which patrons are not willing to walk from a parking space to their destination for a shopping trip.

Table II.A.8

EXISTING PARKING SPACE SUPPLY (Parking Garages Only)

Area of Coverage	Total Capacity of Existing Parking Garages (Spaces)	Estimated Number of Vacant Spaces at Peak Acumulation Period*
1. Five Minutes of Walking Time of the Project Area	4,434	1,100
2. Seven Minutes of Walking Time of the Project Area	8,209	2,025
3. Ten Minutes of Walking Time of the Project Area	11,793	3,550

*Available spaces between 12:00 noon and 2:00 P.M., based on random samples at selected parking garages. Numbers represent very broad estimates.

Source: Barton-Aschman Associates, Inc. Site Analysis, Lafayette Place, Boston, Massachusetts, July 1974, Table 2.

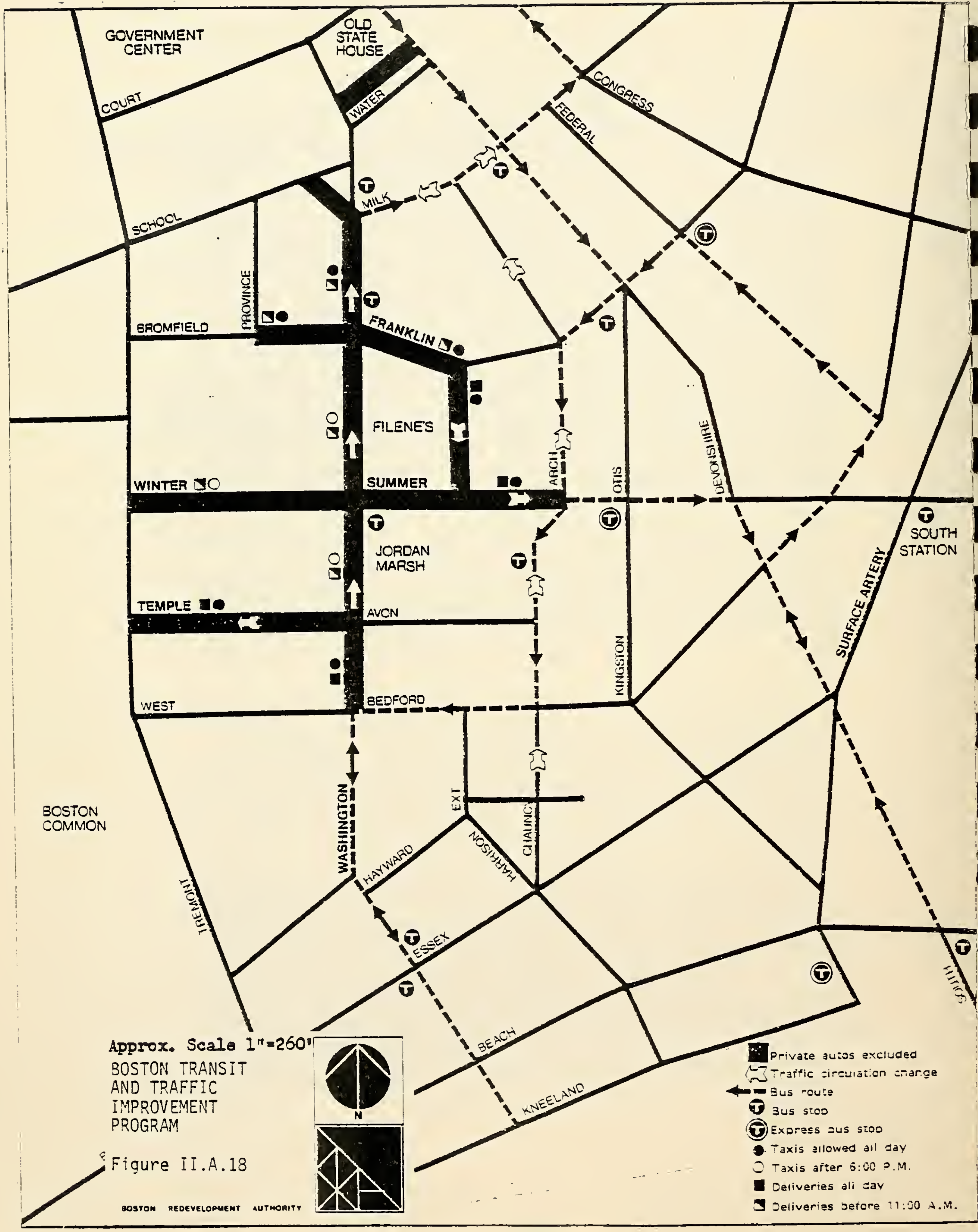
Downtown Transit and Traffic Improvement Program

In terms of future proposals which could affect traffic and circulation conditions at or near the proposed Lafayette Place project, the most significant is the downtown Transit and Traffic Improvement Program (TTIP). The Transit and Traffic Improvement Program, for which the City of Boston, the Boston Redevelopment Authority, and the Massachusetts Bay Transportation Authority have applied for Federal funding under the Urban Mass Transit Administration, Section 3 and Section 6 programs and the Federal Highway Administration Urban Systems program, is a plan to reallocate scarce street space in the Central Business District of Boston to serve more rationally the needs of pedestrians, transit service, goods movement, taxis, and private autos. The main feature of the project is a new distribution of total street right-of-way into various elements including sidewalks, open space, bus stops, taxi stands, loading zones, parking and travel lanes. Several streets with heavy pedestrian usage will be either entirely closed to traffic or have restricted vehicular access. The TTIP is aimed at improving circulation and transit service within the heart of downtown Boston and will be accompanied by design amenities to improve the downtown environment.

The TTIP has three basic components: (1) new circulation systems for buses, pedestrians, cars, taxis, and delivery trucks, (2) physical reconstruction of Winter, Summer, and Washington Streets to improve the pedestrian environement, and (3) special one-year programs to subsidize increased bus operations, provide special maintenance and enforcement efforts, conduct a full-time promotion effort, and evaluate the success of the project at the end of the year.

The TTIP project area covers the core retail and financial districts of downtown Boston and is bounded on the north by State/Court Streets, on the east by the Central Artery, on the south by Stuart and Kneeland Streets, and on the west by Tremont Street. The program is scheduled for implementation in September of 1978 and is currently funded as a one-year demonstration project. A detailed description of the TTIP project is included in Appendix E.

Besides the increased accessibility to the downtown by the local bus system, noted above, the major impact of the TTIP project on the Lafayette Place development will involve traffic circulation changes. These include: (1) the closing of Washington Street above Bedford Street to all vehicular traffic except buses, taxis after 7 P.M., and delivery vehicles before 11 A.M. and after 2 P.M., (2) the reversal of Chauncy-Arch Streets flow from southbound to northbound with an exclusive contra-flow bus lane, and (3) substantially increased vehicular use of Bedford-West Streets to replace, in part, the closing of Summer and Winter Streets. The future relationship of the Lafayette Place project to the TTIP proposal is discussed further in Section b below (also see Figure II.A.18).



Approx. Scale 1"=260'

BOSTON TRANSIT
AND TRAFFIC
IMPROVEMENT
PROGRAM

Figure II.A.18

b. Impact of the Proposed Project

The introduction of a major new activity center, such as that envisioned by the Lafayette Place project development, into the core area of Boston has the potential to impact the operation of the City's transportation system - its network of expressways, local streets, parking facilities, public transportation system, and pedestrian circulation - which employees, shoppers, and visitor utilize daily in making trips to and from, and within, the downtown area. In order to determine the transportation needs of the project and to identify the most desirable and efficient access and circulation system, Barton-Aschman Associates were engaged by the designated developer to analyze traffic and parking conditions and requirements for Lafayette Place.[1] As a basis for this study, analyses were conducted involving the traffic influence area, directon of approach, modes of travel, parking space needs and location, and traffic assignments for the design year and are summarized below.

Traffic Characteristic of the Proposed Project

(1) Traffic Influence Area

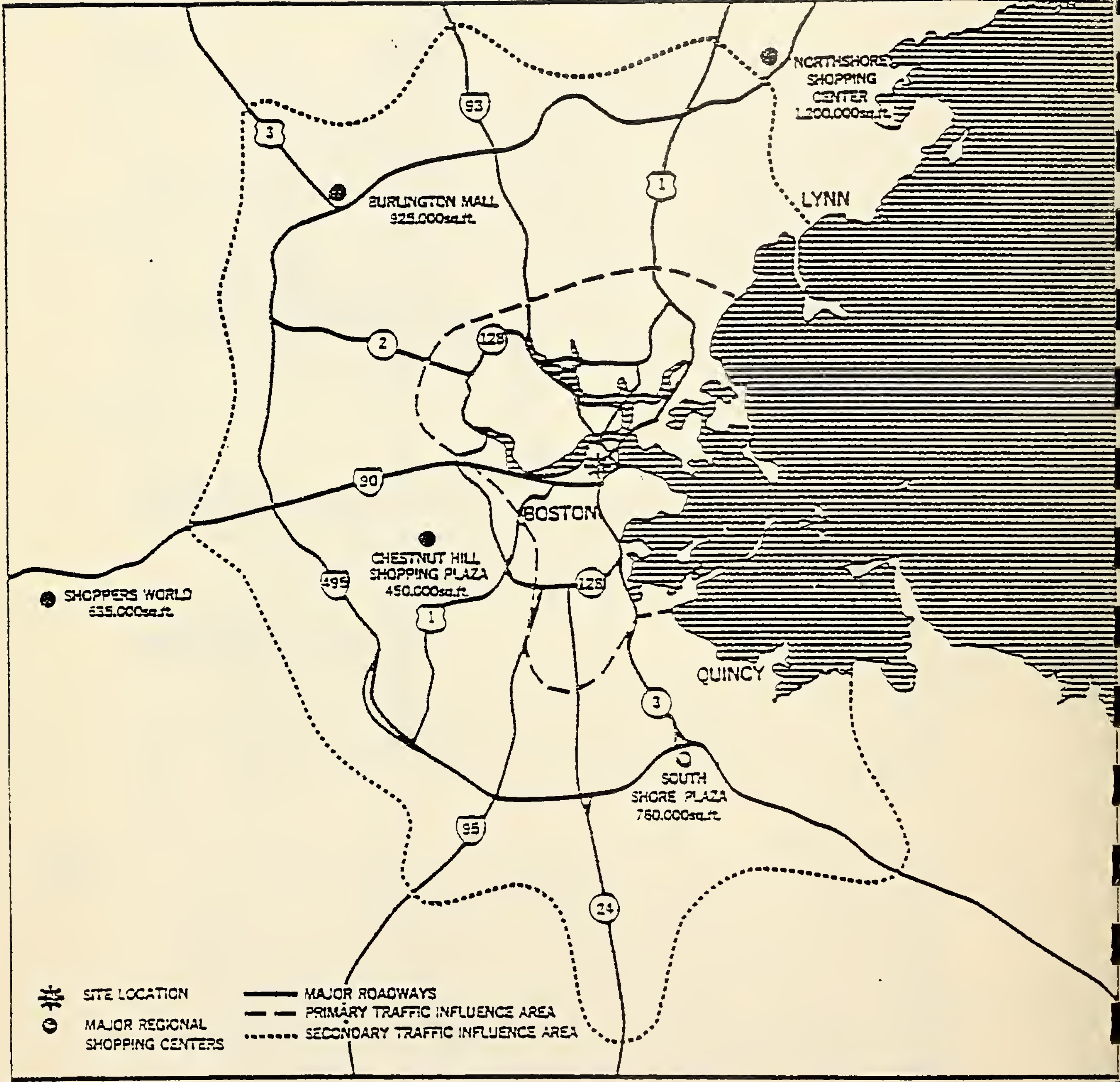
The traffic influence area and the resulting directions of approach to the Lafayette Place site were determined on the basis of the relationship of the site to competing regional retail developments, the locations of major population centers, and their relative accessibility to the project.

Both primary and secondary traffic influence areas were identified (see Figure II.A.19). The primary area was determined by assuming that the project would compete equally with the existing retail areas having stores similar to those proposed for Lafayette Place. The secondary area of influence was defined as the area beyond the primary area, but within 30-minute driving time of the site.

The existing retail developments offering the greatest competition to the site are North Shore Shopping Center, Burlington Mall, Shoppers World, Chestnut Hill Shopping Plaza, and South Shore Plaza. Based on characteristics of similar developments, it is estimated that approximately 75 percent of the patrons of Lafayette Place will live within a 30-minute driving time of the center. The primary area thus was assumed to be within 30 minutes driving time of the site, except wherever competing centers vied for the same market, in which case the primary area was designated as being midway between the competing site and Lafayette Place. The areas affected by competition were designated secondary areas of influence.

---

[1] Barton-Aschman Associates, Inc., Site Analysis, Lafayette Place, Boston, Massachusetts, prepared for SEFRIUS, Developer, Washington, D.C. July 1974.


NORTHSHORE SHOPPING CENTER 1,200,000sq.ft.
93
3
1
BURLINGTON MALL 925,000sq.ft.
LYNN
128
2
90
BOSTON
CHESTNUT HILL SHOPPING PLAZA 450,000sq.ft.
495
1
128
SHOPPERS WORLD 635,000sq.ft.
QUINCY
3
SOUTH SHORE PLAZA 760,000sq.ft.
95
24
SITE LOCATION
MAJOR REGIONAL SHOPPING CENTERS
MAJOR ROADWAYS
PRIMARY TRAFFIC INFLUENCE AREA
SECONDARY TRAFFIC INFLUENCE AREA

N

LAFAYETTE PLACE DEVELOPMENT STUDY
BOSTON, MASSACHUSETTS

Prepared For: SEFRIUS Developers
Prepared By: BARTON-ASCHMAN ASSOCIATES, INC. Transportation Planners
in association with
I. M. PEI & PARTNERS and COSSUTTA & PONTE Architects Planners

Figure II.A.19: TRAFFIC INFLUENCE AREAS

(2) Direction of Approach

The directions from which drivers would approach Lafayette Place were based on the minimum time path to the project. This, in turn, was based on population distribution and correlated with survey data collected at the existing Jordan Marsh store.

The directions of approach for site-destined traffic are shown in Figure II.A.20. It is estimated that approximately 60 percent of the total traffic would approach the site from the regional highway system - 29 percent approaching the site from southbound expressway off-ramps and 28 percent from northbound expressway off-ramps. Approximately 30 percent is expected to approach the site from the west along the Essex-Boylston Streets corridor while small percentages of traffic are anticipated from southbound Tremont Street, north bound Washington Street, and westbound Summer Street.

(3) Mode of Travel

Interviews were conducted in 1974 at the Jordan Marsh store to determine the mode of travel of patrons and employees. Although this survey was relatively brief, it is considered adequate as a basis for estimating the automobile and transit travel demands that would be generated by the project. The total number of interviews was approximately 1,300, including approximately 150 employees. The modal split for patrons and employees as estimated from the survey is illustrated in Figure II.A.21.

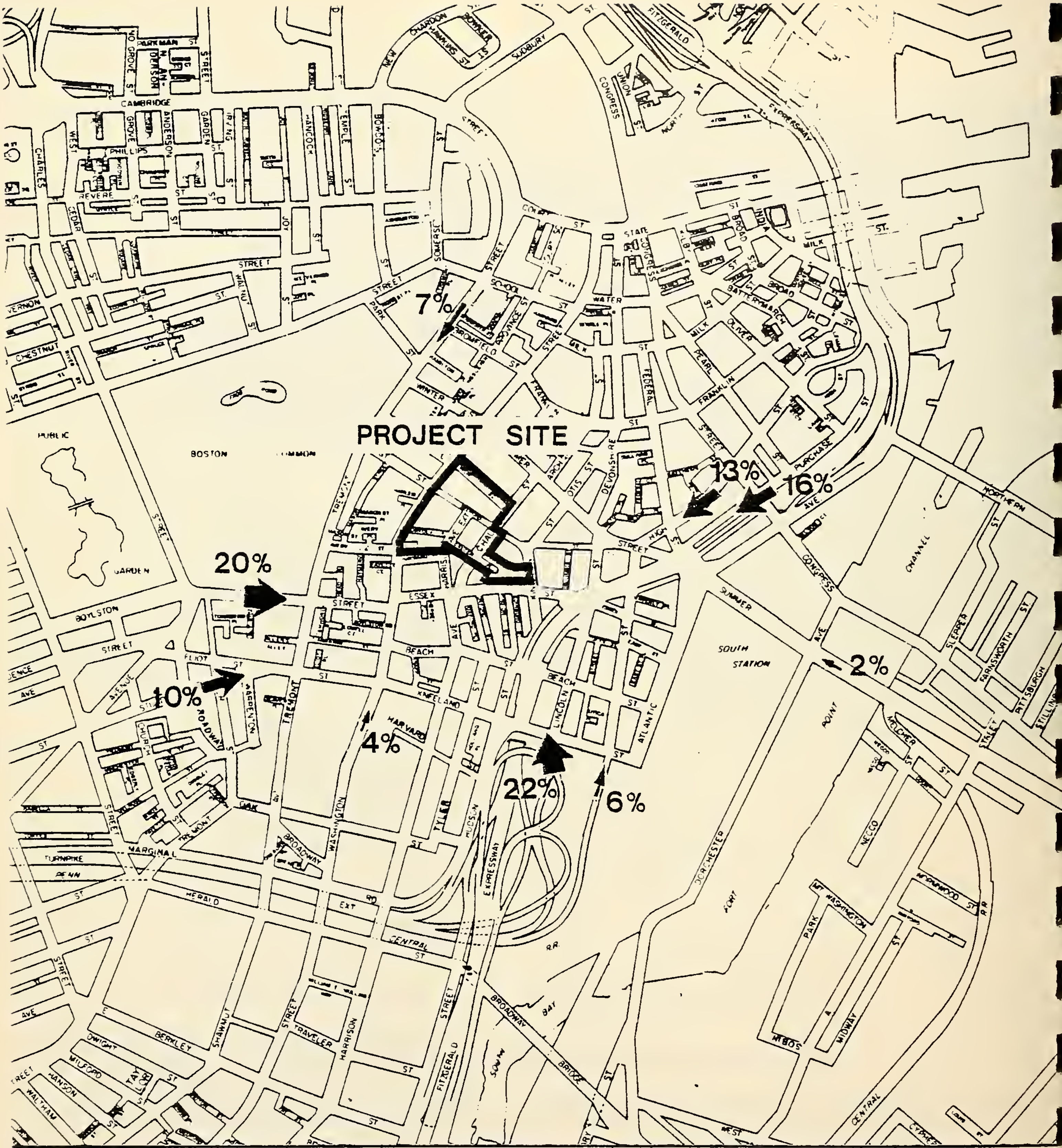
Travel to the Jordan Marsh department store is primarily characterized by a high percentage of subway use, both for shoppers and employees. Approximately 50 percent of the shoppers and 85 percent of the employees used the subway. Approximately 17 percent of the shoppers and 4 percent of the employees in the store used automobiles as their mode of travel. The high percentage of subway use in this area is primarily attributable to the excellent access to the two major transit corridors. Two important factors are relevant in the context:

1. A transit station is connected directly to the basement of the Jordan Marsh store.

2. The frequency of transit service at the peak period is in the range of two to three minutes.

(4) Traffic Generation and Parking Space Demand

The procedure used in determining new traffic generation and peak period parking space requirements was based largely on the results of the travel survey and typical factors associated with retail and hotel development. In developing these estimates, a modal split value for auto use was assumed, based on the Jordan Marsh survey and on additional data collected at the Prudential Center, where the concentration of high quality shops typically generates a higher percentage of auto traffic (estimated at 55% of shoppers).



Source: Barton-Aschman Associates, Inc.

0 800 1600 FT

LAFAYETTE PLACE

DIRECTION OF
TRAFFIC APPROACH

Figure II.A.20

BOSTON REDEVELOPMENT AUTHORITY

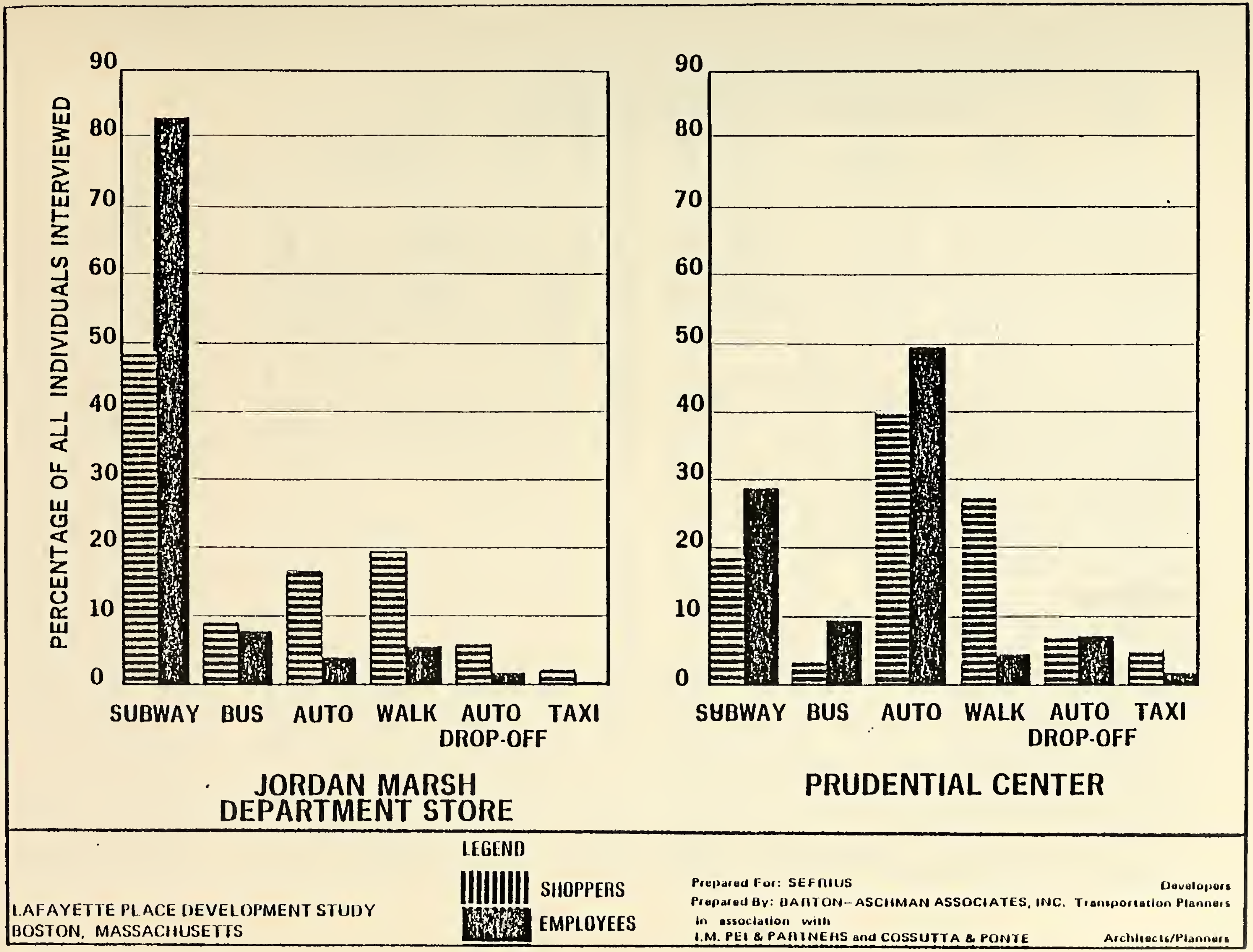


Figure II.A.21: **MODAL SPLITS OF SHOPPERS AND EMPLOYEES**

It is estimated that during the afternoon peak accumulation (2 P.M. to 3 P.M.), there would be a demand for approximately 1,285 parking spaces for the proposed retail/hotel complex. Approximately 1,500 spaces would be required by retail patrons and employees (Lafayette Place and Jordan Marsh) and 230 spaces by hotel guests, employees, and visitors. It is also estimated that during this same one-hour peak period, the number of inbound vehicles destined to the proposed garage would be approximately 300, primarily due to the retail portion of the development; it may be reasonably assumed that at this hour the volumes of inbound vehicular trips generated by the hotel would be insignificant.

Estimates of traffic generated by the proposed Lafayette Place project for each of four peak periods are shown on Table II.A.9. This table indicates that the peak period of traffic generated by the proposed development is the inbound shopper peak (7:00 P.M. to 8:00 P.M.) when 695 inbound and 445 outbound auto driver trips would be generated by the project. However, in terms of traffic impacts on adjacent roadways, the critical design period is the outbound P.M. peak (5:00 P.M. to 6:00 P.M.), when a total of 365 inbound and 530 outbound auto driver trips generated by the project would be added to non site-generated traffic volumes. The inbound and outbound traffic volumes approaching and leaving the site for each of these periods are summarized in Table II.A.10.

Appendix F presents the technical documentation pertinent to the estimation of trip generation and parking demand.

(5) Impact on Vehicular Circulation and Street Capacity

An examination of the impact of the Lafayette Place project on the local street system must, of necessity, consider the implications of the City's Transit and Traffic Improvement Program for the downtown, since both of these projects are intimately tied together. Although the TTIP is a one-year demonstration project (anticipated to begin in September of 1978), it is expected that the circulation changes and street closings will be continued in the future basically as currently proposed (although some modifications possibly may be required as a result of the first year's experience with the program). Therefore, the present analysis assumes the operation of the TTIP when the Lafayette Place project is completed. An analysis of traffic volume changes due to the TTIP project is given in Table II.A.11.

In order to improve vehicular circulation in the project area within the framework of the TTIP, to preserve the integrity of the new development, and to accommodate the traffic generated by the proposed complex and new garage, a number of traffic circulation and street adjustments are planned. Under the TTIP, Summer-Winter Streets and Franklin-Bromfield Streets, both of which presently handle westbound traffic flows, will be closed to vehicular traffic. Because the adjacent one-way westbound street to the north (State-Court Streets) has very little reserve capacity, it is

Table II.A.9

Peak Hour Traffic Generated By The Proposed Lafayette Place Development

	Land-Use		
Time	Retail	Hotel	Total
Outbound PM Peak (5:00 PM to 6:00 PM)			
Inbound	335	30	365
Outbound	475	55	530
TOTAL	810	85	895
Outbound Shopping Peak (9:00 PM to 10:00 PM)			
Inbound	85	15	100
Outbound	640	30	670
TOTAL	725	45	770
Inbound AM Peak (7:00 AM to 8:00 AM)			
Inbound	85	30	115
Outbound	45	15	60
TOTAL	130	45	175
Inbound Shopping Peak (7:00 PM to 8:00 PM)			
Inbound	585	110	695
Outbound	335	110	445
TOTAL	920	220	1,140

Source: Appendix F

Table II.A.10

Site Generated Traffic Volumes By Direction of Approach/Exit - Peak-Hour Periods

Direction of Approach/Exit	5:00-6:00 PM		9:00-10:00 PM		7:00-8:00 AM		7:00-8:00 PM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
East - Summer Street	10	10	5	15	5	0	15	10
East - Purchase Street Off-Ramp	60	--	15	--	20	--	110	--
East - High Street	50	--	10	--	15	--	90	--
East - Atlantic Avenue On-Ramp	--	155	--	195	--	20	--	130
West - Boylston-Essex	70	--	20	--	20	--	140	--
West - Stuart/Kneeland	35	55	10	70	10	5	70	45
West - Tremont/Boylston	--	105	--	135	--	10	--	90
North - Tremont Street	25	--	10	--	10	--	50	--
North - Chauncy-Arch	--	35	--	45	--	5	--	30
South - Washington Street	15	20	5	25	5	0	30	15
South - Lincoln Street Off-Ramp	80	--	20	--	20	--	150	--
South - South Street Off-Ramp	20	--	5	--	10	--	40	--
South - Surface Artery On-Ramp	--	150	--	185	--	20	--	125
TOTAL	365	530	100	670	115	60	695	445

Table II.A.11

Analysis of Traffic Volume Changes as a Result of TTIP Project Lafayette Place Project Vicinity

Street Segment	P.M. Peak Hour Volume Existing[1]	TTIP[2]	Change in volume	No. Travel Lanes (TTIP)[3]
WASHINGTON (NB)				
Essex-West	990	50	-940	1+bus
West-Temple	740	0	-740	closed to auto
Temple-Summer	970	0	-970	closed to auto
HARRISON (SB)				
Beech-Essex	360	215	-145	3
Essex-Bedford	175	250	+ 75	2
CHAUNCY (SB exist. NB prop.)				
Essex-Bedford	425	140	-285	2
Bedford-Summer	285	140	-145	2+bus
KINGSTON (SB)				
Essex-Bedford	295	375	+ 80	3
Bedford-Summer	280	700	+420	2
BOYLSTON/ESSEX (EB)				
Tremont-Washington	650	515	-135	3
Washington-Harrison	450	675	+125	3
Harrison-Kingston	450	500	+ 50	3
Kingston-Surface Artery	540	500	- 40	3
HAYWARD PL. (EB)				
Washington-Harrison	32	N.A.	N.A.	2
AVERY (WB exist. EB prop.)				
Tremont-Washington	107	N.A.	N.A.	2

Table II.A.11 (cont'd) Street Segment	P.M. Peak Hour Volume Existing[1]	 TTIP[2]	Change in volume	No. Travel Lanes (TTIP)[3]
WEST/BEDFORD (WB)				
Tremont-Washington	190	590	+400	2-3
Washington-Chauncy	140	540	+400	2+bus
Chauncy-Kingston	235	640	+405	2
TEMPLE PL. (EB exist. WB prop.)				
Tremont-Washington	230	0	-230	close to auto
SUMMER (WB exist. EB prop.)				
Washington-Arch	400	0	-400	close to auto
Arch-Otis	550	0	-550	close to auto

1 Existing volumes derived from 1971-1977 traffic counts furnished by Boston Redevelopment Authority, Transportation Planning Department, and City of Boston Traffic and Parking Department.

2 Volume reasignments prepared by Allan M. Voorhees and Associates for the Boston Area Restricted Zone Study (1977).

3 Projections based on total street right-of-way, assuming maximum enforcement of parking regulations and new parking prohibitions and taking proposed physical changes into account.

anticipated that much of the westbound traffic flow will be diverted further to the south and will use both the Bedford-West Streets and the Stuart-Kneeland Streets corridors. As a result, peak hour traffic flow on Bedford and West Streets will increase some 200-300%.

Since the Lafayette Place project will require the closing of Bedford Street, between Chauncy and Washington Streets, to allow for a contiguous development parcel, it is necessary that an alternate route be constructed to handle the displaced westbound traffic, as well as to serve the proposed project and garage. Therefore, as part of the Lafayette Place development, the City will construct a new east-west arterial beginning at Kingston and Essex Street and running along the general alignment of Rowe Place, Exeter Place, and Norfolk Street to Washington Street, where westbound flows will continue via West Street to Tremont Street. The new arterial will have a 40-foot roadway to accommodate two travel lanes and an exclusive bus lane. The extension of this arterial to Kingston Street is necessary since Chauncy Street must flow northbound under the TTIP plan and could never handle a southbound flow from Bedford Street (Figure II.A.22).

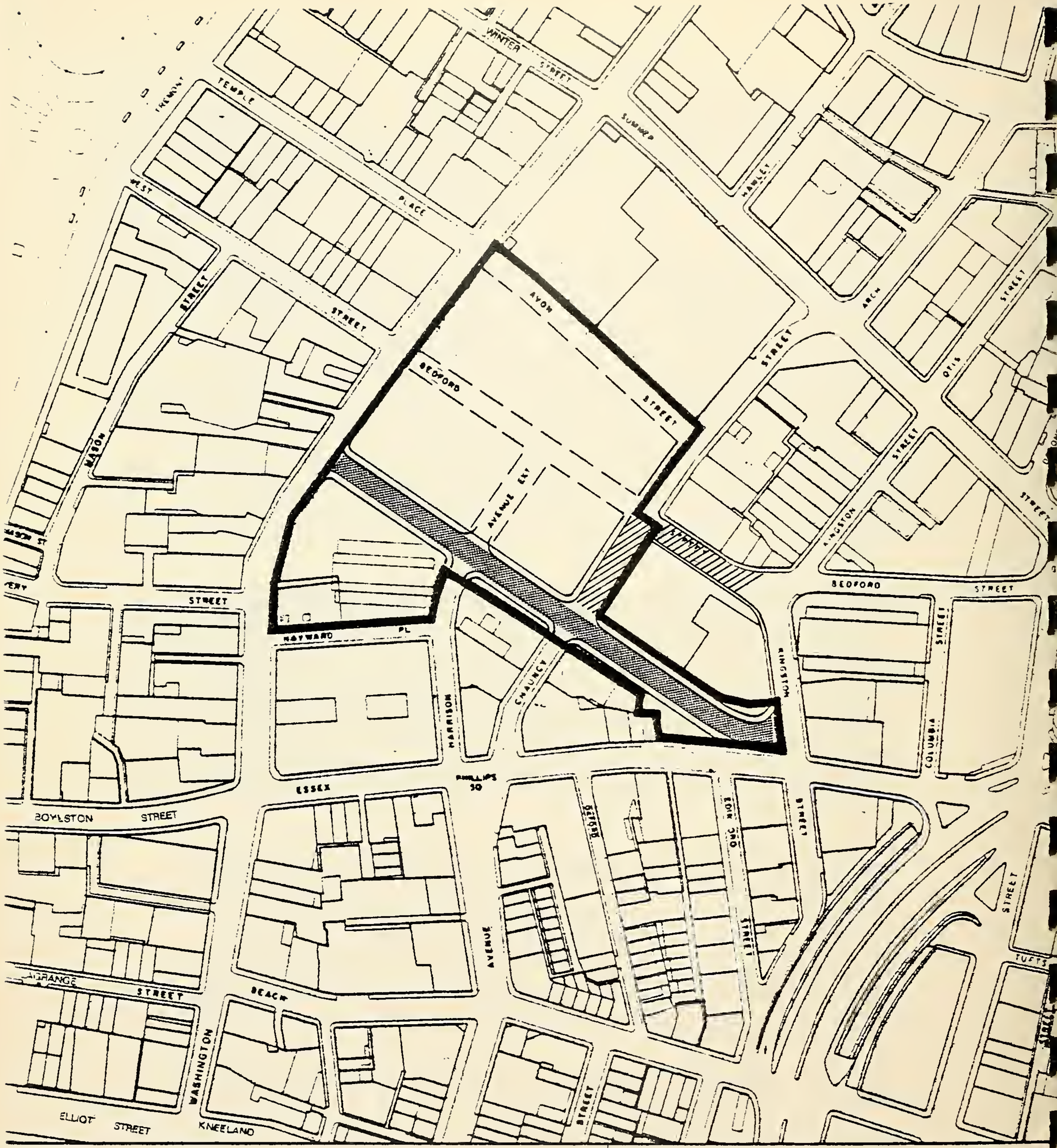
Chauncy Street will be widened from present Bedford Street to the new arterial to add one lane to its width, thereby making Chauncy Street consistent in width from Summer Street to the new street. This widening also will allow for the contra-flow of buses and will facilitate all vehicular movements onto the new street. To improve access to and egress from the Lafayette Place garage, Bedford Street will be widened and made two-way between Chauncy and Kingston and one-way eastbound between Chauncy and Church Green to serve as the major exiting route for site generated traffic destined to the expressway system, as well as an ancillary access route from the north.

Primary access and egress to and from the garage will be from the new arterial street, with secondary access and egress provided on Chauncy and Bedford Streets. The location of the Chauncy Street entrance/exit will be in the same location as existing Bedford Street and will be controlled by signals having bus priority and pedestrian phases. The entrance/exit point on the new arterial will be opposite Harrison Avenue Extension. These locations will provide smooth site access and egress while minimizing interference with traffic on adjacent roadways and the pick-up/drop-off operation at the hotel lobby.

The above changes are expected to have the following effects on downtown circulation:

(1) Creation of more legible routes:

The closing of the streets within the project area, the construction of the new east-west arterial, and the widening of Chauncy Street will provide a logical circulation pattern



▩ NEW STREET

- - - - DISCONTINUED STREETS

▨ STREET WIDENING

0 200 400 FEET

N

LAFAYETTE PLACE

PROPOSED STREET REALIGNMENTS

Figure II.A.22

BOSTON REDEVELOPMENT AUTHORITY

through this section of the downtown. The new pattern will compliment the TTIP and provide for better connections to the expressways (via the reversed Bedford Street).

(2) Accommodation of existing traffic displaced by changes:

The proposed circulation plan also accommodates the vehicles displaced by the closing of Bedford Street. Projected P.M. peak TTIP volumes show 640 cars on Bedford Street between Kingston and Washington Streets, which will use the new street independent of the Lafayette Place construction. The capacity of the new street will be sufficient to accommodate these volumes.

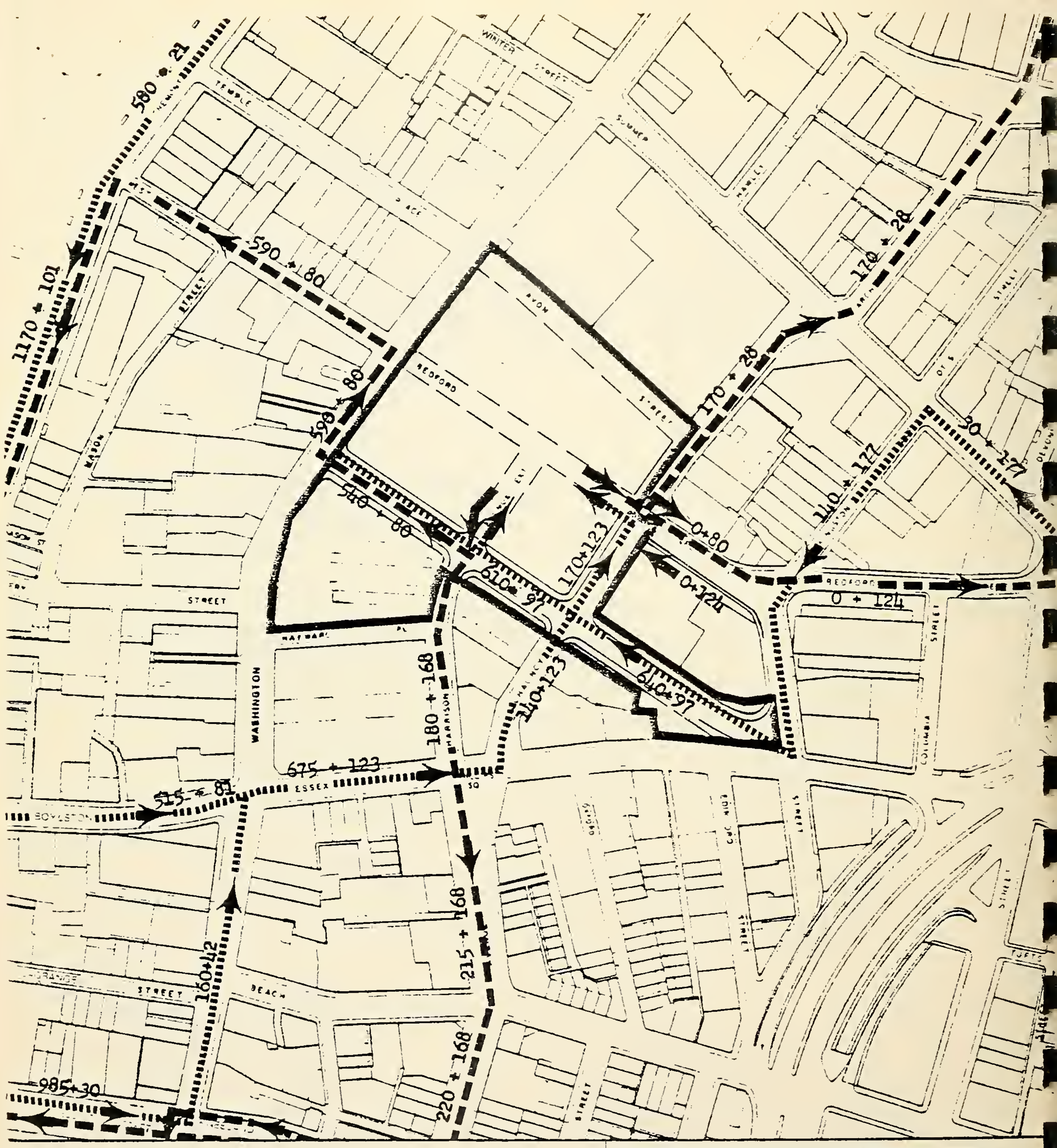
(3) Accommodation of traffic generated by the proposed project:

The Chauncy Street widening, the widening and directional changes on Bedford Street from Chauncy Street to Church Green, and creation of the new street will allow for improved local circulation to handle the traffic generated by the new garage.

In order to evaluate the effects of the added volumes due to the Lafayette Place project and garage, an analysis of the approach and exit routes was made by the BRA Transportation Planning Department. Traffic assignments, based on estimated percentages of trips generated by each of the travel corridors (Figure II.A.20), were conducted for the afternoon peak between 4:30 and 5:30, as this one-hour period was identified as the most critical period. In this analysis, as noted above, it was assumed that the TTIP circulation scheme as currently proposed would be in effect. Figure II.A.23 shows the garage generated volumes added to the TTIP volumes for all affected streets in the vicinity of the project site.

In the P.M. peak hour, the Lafayette Place garage is projected to generate 400 outbound and 300 inbound vehicular trips. As can be seen from Figure II .A.23, the greatest impacts from the garage would be felt on the following street segments:

Street Segment	TTIP Volume	Garage Volume	Garage Increase
New Street, from Kingston to Harrison	610	97	15.9%
Summer Street, from Purchase to South	200	93	46.5%
Harrison Ave. Ext., from New to Hayward	250	168	67.2%
Summer Street, from South to Devonshire	260	177	68.1%
Chauncy Street, from Essex to Bedford	170	123	72.4%
Kingston Street, from Summer to Essex	140	97	69.2%
Bedford Street, from Chauncy to Summer	0	124	-
Bedford Street, from Kingston to Chauncy	0	80	-



OUTBOUND ROUTE

INBOUND ROUTE

P.M. PEAK TRAFFIC VOLUMES

TTIP Volume + Lafayette Place Garage Volume
100 + 10

0 200 400 FEET

LAFAYETTE PLACE

P.M. PEAK (4:30-5:30)
LAFAYETTE PLACE GARAGE
AND TTIP VOLUMES
JUNE 1,1978
Figure II.A.23
BOSTON REDEVELOPMENT AUTHORITY

According to the BRA Transporation Planning Department analysis of the traffic assignments, no capacity problems are projected as a result of the Lafayette Place development. This is due, in part, to added capacity to the streets as a result of anticipated implementation of the TTIP enforcement program (it is imperative that the TTIP parking prohibitions be strictly enforced, particularly during the peak hours, in order to insure smooth traffic flow), and in part to the addition of travel lanes to certain streets, the redesigning of signal phasing, and other operational improvements that are proposed.

Nevertheless, as a result of the implementation of TTIP, it is projected that at selected locations some increases in congestion will result from the traffic reassignments and a number of intersections will experience reduced levels of service (at the same time, it should be noted that congestion will be reduced considerably, and levels of service improved, at several important downtown intersections). Based on BRA traffic assignment analysis, the Lafayette Place garage generated traffic would contribute from less than 1% (at Washington-Milk Streets) to nearly 70% (at Kingston-Bedford Streets) of the total traffic at intersections where reduced levels of service or congestion problems are anticipated (see Table II.A.12). In nearly all cases, however, the reduction in service is directly due to TTIP traffic reassignments rather than generation by the Lafayette Place project, since the analysis was performed under existing conditions without the new development. In a few cases, congestion problems would be exacerbated during P.M. peak hours as a result of the addition of Lafayette Place garage generated traffic.

TABLE II.A.12

Intersection Analysis - TTIP and Lafayette Place Generated Traffic

Intersection	TTIP Volume	Garage Volume	Total Volume	Garage Contribution
Washington-Milk	1,075	28	1,103	.03
Arch-Franklin	760	28	788	3.6
Summer-High	565	301	866	34.8
Chauncy-New	810	300	1,110	27.0
Washington-New	590	80	670	12.0
Kingston-Bedford	140	301	441	68.4
Essex-New	1,140	97	1,317	11.7
Phillips Square	855	291	1,146	25.4
Harrison-Kneeland	2,415	168	2,583	6.5

With respect to the Lafayette Place garage access/egress, a BRA analysis indicates that an estimated 46% of the inbound traffic and 62% of the outbound traffic would utilize the entrance/exit to be located on the new arterial, whereas inbound and outbound volumes at the Chauncy Street entrance/exit would be 54% and 46% respectively. While it is possible that queuing may result during some periods of heavy demand, the existence of two travel lanes on the approach streets should insure that one lane would be available for through-traffic, thus minimizing the potential for congestion problems.

(6) Construction Period Impacts

During the construction period of the Lafayette Place project and street improvements, restrictions to normal traffic flow may be anticipated leading to temporary congestion problems on the adjacent and nearby streets. Such periods will occur while excavation and construction work is being done within or immediately adjacent to the existing rights-of-way and as a result of the movement of trucks and equipment to and from the site. During the period of maximum truck generation activity, which will occur during the early part of the project, it is estimated that some 134 truck trips will be generated on a daily basis, or approximately 17 per hour. While this number is not significant when compared to average daily vehicular volumes in the area, their large size and requirements for maneuverability could cause short delays in the general traffic flow. These impacts, however, can be minimized through the careful scheduling of arrivals and departures to avoid periods of peak traffic and by providing on-site queuing space for waiting construction vehicles. In addition, the location of the site three blocks from the regional expressway system should minimize the need for these trucks to travel on congested or heavily-used local streets for any distance.

The major impact during the construction period will be the necessity to discontinue Bedford Street, which is expected to occur prior to the construction and availability of the new east-west arterial. Since there are no other acceptable existing route able to accommodate the heavy westbound flow, Bedford Street could not be eliminated without a suitable alternative to handle the westbound traffic demand. To mitigate this impact, it is proposed to construct a temporary right-of-way along or beside the future alignment of the proposed new east-west arterial to replace Bedford Street, until such time as the new street is permanently constructed. Of necessity, construction of the arterial will need to be staged so as to permit the continued operation of the temporary roadway to the maximum extent possible.

Public Transportation

The proposed Lafayette Place project is not expected to have any adverse impacts on the existing public transportation system. Although the transit lines which serve the project area are, as indicated previously, operating near or above capacity during the peak hours, ranging from 92% on the Red Line to 105% on the Blue Line, only an insignificant number of additional riders are expected to be added to the system at peak periods. Based on trip-generation analysis by Barton-Aschman, it is estimated that an additional 255 riders would be added to the transit lines during the P.M. rush hour period, distributed among the four lines according to the distribution pattern of origin to the site. Highest percentages - 30% or 73 riders - would be added to the southbound Red Line and northbound Orange/Blue Lines. The maximum project-generated increase would be 0.9% on the Blue Line, which is already overcapacity at rush hour.

During the morning, the majority of the inbound trips are assumed to occur after the A.M. peak hour (8-9 A.M.), since the retail stores generally are not expected to open before 9 o'clock. Although the majority (90%) of the 1,141 employees are expected to use public transportation (including buses) or to walk to the site, their number and time of arrival is not expected to affect significantly rush hour transit capacity. Minimal transit use is projected for the hotel guests and visitors.

Futhermore, programs planned or under consideration by the MBTA to improve transit service in the future, including the use of 6-car trains and reducing headway times, are expected to increase the capacity of the system (see Table II.A.7 above). If these improvements are implemented by the time the Lafayette Place project is opened, sufficient capacity should be available to accommodate future demands generated by the project. At the same time it should be noted that projected normal growth in downtown daytime population (and their potential transit ridership) plus the addition of patrons from such major development projects as Park Plaza (which, for the most part, is not expected to occur until after Lafayette Place has been built) could increase use beyond programmed capacities at certain periods.

As part of the transit improvements, a station modernization program currently is underway by the MBTA, the results of which will favorably impact the Lafayette Place project. Reconstruction of the Washington Street station will provide a new fare-free passage and underground shopping concourse between Jordan's and Filene's basements, new entrances to the stores and streets, new stairs and escalators, and new fare collection points. Transfers between the Orange Line and Red Line will make use of a refurbished under-track passageway, and an existing tunnel between Park Street and Washington Street will be opened as a pedestrian connection, allowing a protective, weather-free passage from the Green Line directly to Jordan Marsh/Filene's and the Lafayette Place project via proposed public pedestrian easements.

The Essex Station also will be modernized under this program and will include the opening of a tunnel along Washington Street on the northbound side and adding new circulation elements to connect to the Lafayette Place development. Platforms also will be lengthened to accommodate 6-car trains. At the present time, the Park Street station is undergoing a substantial facelifting as well.

The transit station improvements and interior connections between stations and the major downtown retail stores should help reduce pedestrian impact on the streets by providing an easier and safer transfer between stations. As a secondary effect, these measures can make transit more attractive for employees, shoppers, and visitors, thus decreasing the amount of vehicles that might be generated by the proposed Lafayette Place project. In addition, as noted earlier, several new bus routes will be added to the retail core under the TTIP project with anticipated increases in ridership as a result.

Finally, Lafayette Place is not expected to cause any capacity constraints for either of the two rail commuter lines serving Boston, both of which currently operate below capacity during rush hours. Scheduled capacity increases as part of the Commuter Rail Improvement Program, on the other hand, should help improve future levels of service. Moreover, the proposed upgrading of the South Station terminal into a major transportation center within the next few years with new facilities for the MBTA rapid transit and rail commuter lines, and the possible inclusion of a commuter bus terminal, should improve the accessibility of the downtown area, and Lafayette Place, by mass transit.

Pedestrian Circulation

With the implementation of the Lafayette Place project, pedestrian volumes in the project area, particularly along Washington Street, are expected to increase significantly, as the retail and hotel facilities will serve to draw several thousand shoppers and visitors to the new complex daily. At the same time, projections by the Boston Redevelopment Authority estimate a 1970-1985 growth of 118,800 persons, or 43%, in the accumulated daily population of the central area of Boston (downtown and Back Bay). A proportional increase can be expected in the retail core.

To accommodate adequately the projected increased pedestrian circulation demand, several pedestrian improvements are proposed. The sidewalks along Washington Street and the other streets bordering the Lafayette Place project will be widened to increase their capacity to acceptable levels, which will result in the positive impact of increasing pedestrian mobility and safety. Within the development itself a two-level public pedestrianway is proposed to connect the public plaza in the interior of the retail complex with Summer Street and the Washington Street MBTA station, via a public pedestrian easement through the Jordan Marsh retail store. This internal circulation system thus will help to relieve pedestrian concentration on the Washington Street sidewalk areas.

Further improvements to the pedestrian environment will result from the closing of Washington Street at Bedford Street as part of the TTIP project and the conversion of Washington Street above Bedford Street to a pedestrian transitway. Within this transitway all vehicular traffic would be prohibited with the exception of bus service (northbound), taxis in the evenings only, and goods delivery by truck before 11 A.M., and after 2 P.M. by special goods haulers such as mail trucks, newspaper deliveries, and parcel deliveries. An estimated 280 buses are projected to travel along Washington Street on an average day, with peak hour volumes of 30 buses. With the redirection of the traffic circulation pattern in downtown Boston from the TTIP project, daily volumes on Washington Street south of Bedford Street are expected to be reduced considerably from 10,690 to 670. These measures will serve to reduce congestion, and to alleviate or eliminate as much as possible conflicts between vehicular traffic and pedestrians and thus will favorably impact the development of Lafayette Place.

In the short-term, during the construction period, pedestrian circulation adjacent to the site may be interupted or prevented due to demolition, excavation, and construction activities. Sidewalks immediately bordering the site may be closed temporarily as a precautionary safety measure or to allow equipment to enter upon the site. Where sidewalks or pedestrian lanes are kept open, protective coverings will be required to be erected as a safety measure in compliance with City of Boston Building Department regulations. These impacts will be mitigated considerably by the fact that the greater part of the construction-related activities will take place after implementation of the TTIP project.

Parking

During the construction period of the proposed project, all of the existing 282 surface parking spaces on the Bedford-West, Bristol, and Code Realty parcels will be unavailable for use, until the underground garage is opened in 1980. Renovation of the Hayward Place garage during the same period likewise would necessitate its closing to any parking, with the resulting temporary loss of 700 spaces, and the widening of Chauncy Street would reduce the number of spaces on the Edison lot. As indicated earlier, however, a surplus of over 1,000 spaces exists in parking garages during peak accumulation hours in the immediate vicinity of the project site and could adquately handle the needs of the displaced parking. Therefore, the construction of Lafayette Place should not result in any temporary adverse impacts on the local parking situation or the availability of spaces.

In the long-term, the Lafayette Place development is estimated to generate 4,988 one-way auto trips per day. An additional 8,294 one-way auto trips would be generated by the Jordan Marsh department store, which will be intimately tied into the Lafayette Place project and will be served by the garage as well. Total one-way auto trips therefore, are estimated at 13,282 per day, compared to 9,912 trips from current land uses in the area.[1]

---

[1] For the basis of trip generation estimates, See Appendix M.

Including the needs of Jordan Marsh, the projected peak-period parking requirement is 1,285 spaces (see Appendix F). The planned provision of 1,500 parking spaces (900 in the new underground garage and 600 spaces in a modernized Hayward Place garage) will adequately meet the requirements of the new multi-use development and Jordan Marsh.

On relatively few occasions, such as holiday shopping periods, when it is possible that demand would exceed available capacity, other existing parking spaces in close proximity to Lafayette Place would be available, since such occasions normally would occur during office building off-hours (e.g., on Saturdays and on some evening periods).

With three travel lanes at each of the two entrance/exit points, the Lafayette Place garage would be able to handle a maximum of 600 inbound cars per hour, or 350 outbound cars, per lane. Since the peak hourly volume for the garage is estimated 800 cars (400 inbound and 400 outbound, between 1 P.M. and 2 P.M.), the garage is designed to adequately handle expected usage without resulting in problems of delay or queuing.

As noted in the traffic circulation impact analysis above, the Lafayette Place garage is not expected to adversely affect the local street system. Since the operation of the garage will be designed to accommodate retail patron parking demands, with a rate schedule structured to discourage commuter parking, the garage-generated trips will be dispersed throughout the day and evening hours rather than be concentrated during the morning and afternoon rush hours. BRA studies estimate that a total of approximately 400 cars would exit from the Lafayette Place and Hayward Place garage, in the P.M. peak hour, or 9 percent of total daily trips. (In 1975, a BRA survey indicated that lots and garages in the project area generated 3,480 auto trips per day, with approximately 1,000 of those in the peak hour, or 28% of the total.) With the transition from commuter parking to shopper parking to service the retail development, the new and improved parking facilities can be expected to generate less auto traffic on the P.M. peak hour than is currently generated.

Since the future disposition of the Hayward Place garage is presently uncertain, only minimal repairs and renovation will be made to the garage structure at this time. In particular, the existing mechanical elevator operation will not be replaced by a ramp system as had been originally proposed, due to the excessive costs involved for a possibly short-term use. As a result, there will be minimal improvements to the overall operation of this garage and its present inefficiences will be continued. This could result in some delays and queuing at the garage entrance, especially during peak periods. Access to the Hayward Place garage will be from Harrison Avenue Extension and Hayward Place. Since Harrision Avenue Extension will be a major departure route foar the Lafayette Place garage, queuing for the Hayward Place garage could result in temporary congestion and delays on adjacent streets. However, this impact will be mitigated by the fact that Harrison Avenue Extension will have two travel lanes one-way (southbound) and would have adequate capacity to handle anticipated through traffic with only one lane in operation.

Part II.A. PHYSICAL ENVIRONMENT

5. Infrastructure and Energy Resources

a. Description of Existing Conditions

A comprehensive network of collection and distribution lines, providing all types of public and private utility service, is located in the streets within and abutting the project site and are part of the system serving the downtown core area of Boston. This network includes City of Boston water, high pressure fire protection, sanitary sewerage, and storm drainage systems, Boston Edison electrical and steam service, Boston Gas, and New England Telephone.

Water Supply

The principal water supply system for the area is the City of Boston high and low service systems, which supply water for domestic and commercial uses and also afford building fire protection. This system is installed in a grid pattern and gives complete service to the project area.

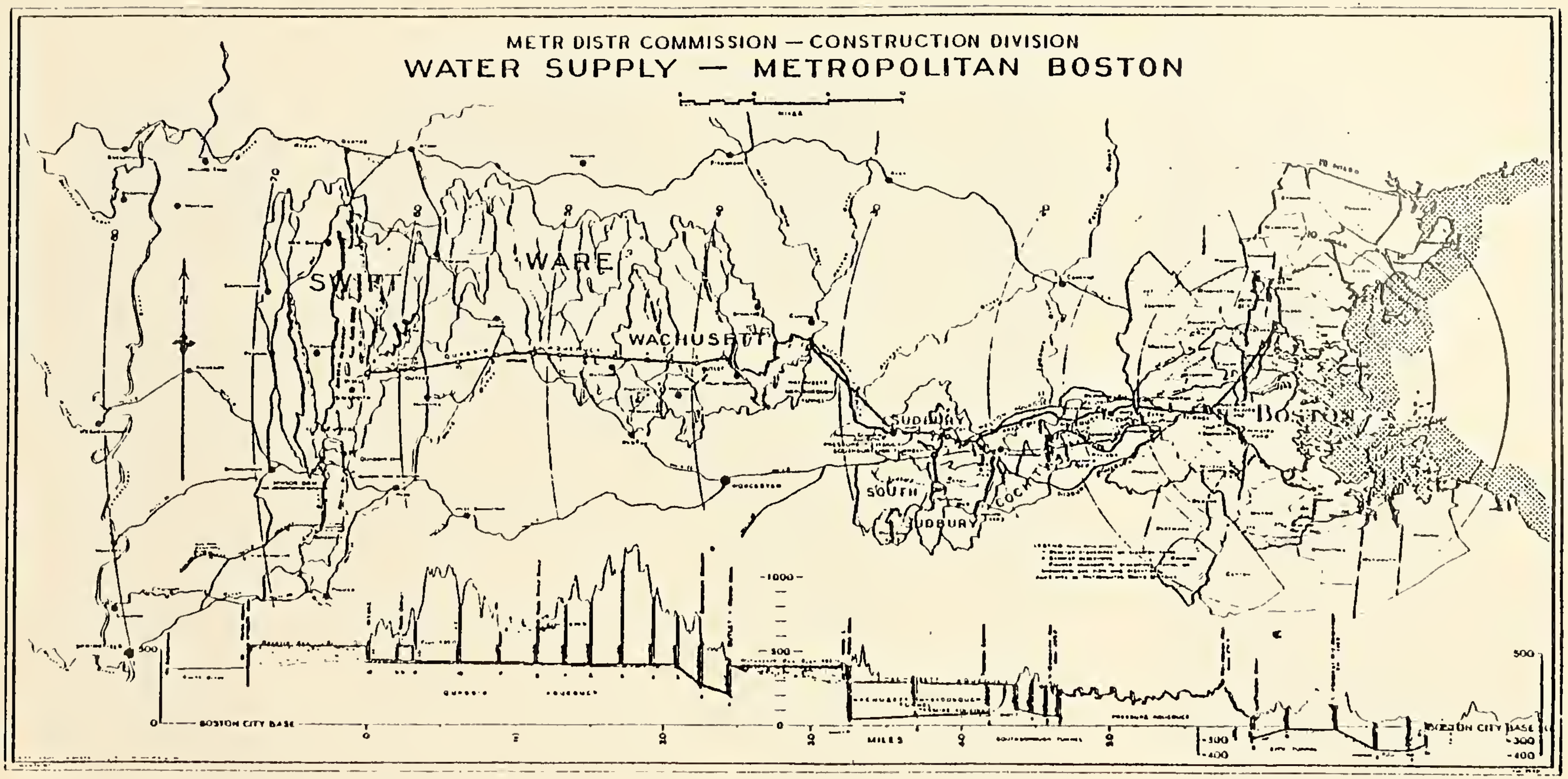
Water is supplied by the Metropolitan District Commission (MDC) water system, which services Boston and 43 other cities and towns in the Boston Metropolitan Area (Figure II.A.24). The principal sources for this water are the Quabbin and Wachusetts Reservoirs, located in the north-central part of the state. Distribution to the member communities is through a series of aquaducts, tunnels, and mains and storage and distrubution reservoirs.

As of 1975, the MDC system required an average of 330 million gallons per day (MGD) of water and a maximum of 416 MGD when demand rises with temperature. Total pumping capacity is over 450 MGD. However, according to the U. S. Army Corps of Engineers in an October 1974 water study report, maximum dependable safe yield from the MDC sources is 300 MGD. The City of Boston is the largest user in the system. In 1974, the City required approximately 52,925 billion gallons of water, or an average daily demand of nearly 145 MGD. Therefore, the City of Boston demand is approximately 48% of the total dependable safe yield. In terms of per capita use, however, Boston is the lowest per capita user (39 gpcd) among the MDC communities.

The quality of the water is excellent. Due to this high quality and drastic restriction on recreational use and public access to reservoirs, no purification facilities are required. Treatment is confined to small amounts of chlorine and ammonia as water enters the distribution lines; recently, fluoridation has been added to the system. The MDC maintains three laboratories to analyze water samples from various watershed streams, reservoirs, aquaducts, and water mains to insure that all water furnished by the MDC to the City will meet United States Public Health standards.

CORPS OF ENGINEERS

U S ARMY



NORTHEASTERN UNITED STATES
WATER SUPPLY STUDY

METROPOLITAN DISTRICT COMMISSION
EXISTING WATER SUPPLY SYSTEM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS

PLATE 6

Figure II.A.24 Metropolitan Boston Water Supply System (MDC)

The City of Boston receives its water supply at 24 metered junctions with the MDC mains, most of which extend only to the City limits. From these points, the City's trunk mains convey the water into the distribution network. Service to the downtown area, including the Lafayette Place site, is provided by both the Southern Low Service (SLS) and Southern High Service (SHS) (Figures II.A.25 - II.A.27). The SLS is a subdivision of the main low service system and supplies water to about one-third of the City area south of the Charles River. Additionally, the SLS is the primary water supply to the High Pressure Fire System. The SHS also serves a large area of the City south of the Charles River and furnishes approximately 45% of total Boston demand. With the extensions of high service mains into low service areas, the high service supplies domestic water to a large number of buildings reaching elevations higher than 100 feet. Also, the SHS supplies sprinkler systems and standpipes in many buildings in the congested high value district and provides emergency water supply to the High Pressure Fire System. Approximate minimum static water level for the SLS is 170 feet and for the SHS, 260 feet.

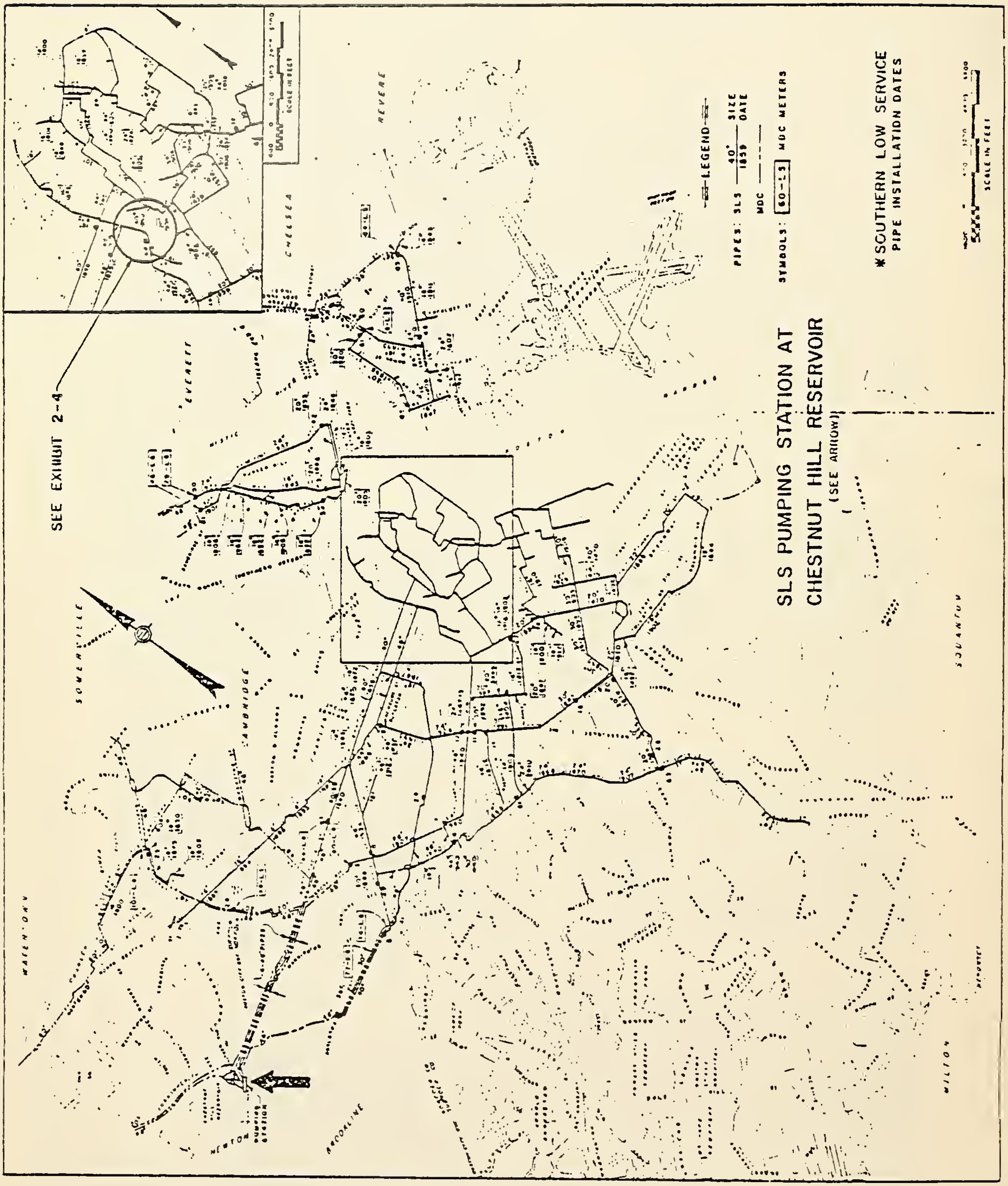
High Pressure Fire System

In addition to the services which distribute the normal water demands within the City, there is a separate system, known as the High Pressure Fire System, designed specifically to provide fire protection in the congested high-value district of the downtown business area (Figures II.A28/29). This system, which was established early in the twentieth century, consists of a pumping station at Kneeland Street, a pumping station at Atlantic Avenue, and approximately nineteen miles of unlined cast iron pipe. Pipes running under Bedford Street and Chauncy Street directly serve the project site.

The Kneeland Street Station (Pumping Station No. 1) is the primary source of water pressure for the system. Adjacent to the station is a Boston Edison steam plant which supplies the steam necessary to operate the two pressurizing pumps at the station. The Atlantic Avenue Station (Pumping Station No. 2) contains two electric powered pumps and serves as a backup station. Capacity of the pumps at each of the stations is in the vicinity of 4,000 gallons per minute at 200 psi discharge pressure, which is the maximum pressure used.

Sanitary Sewage and Storm Drainage Systems

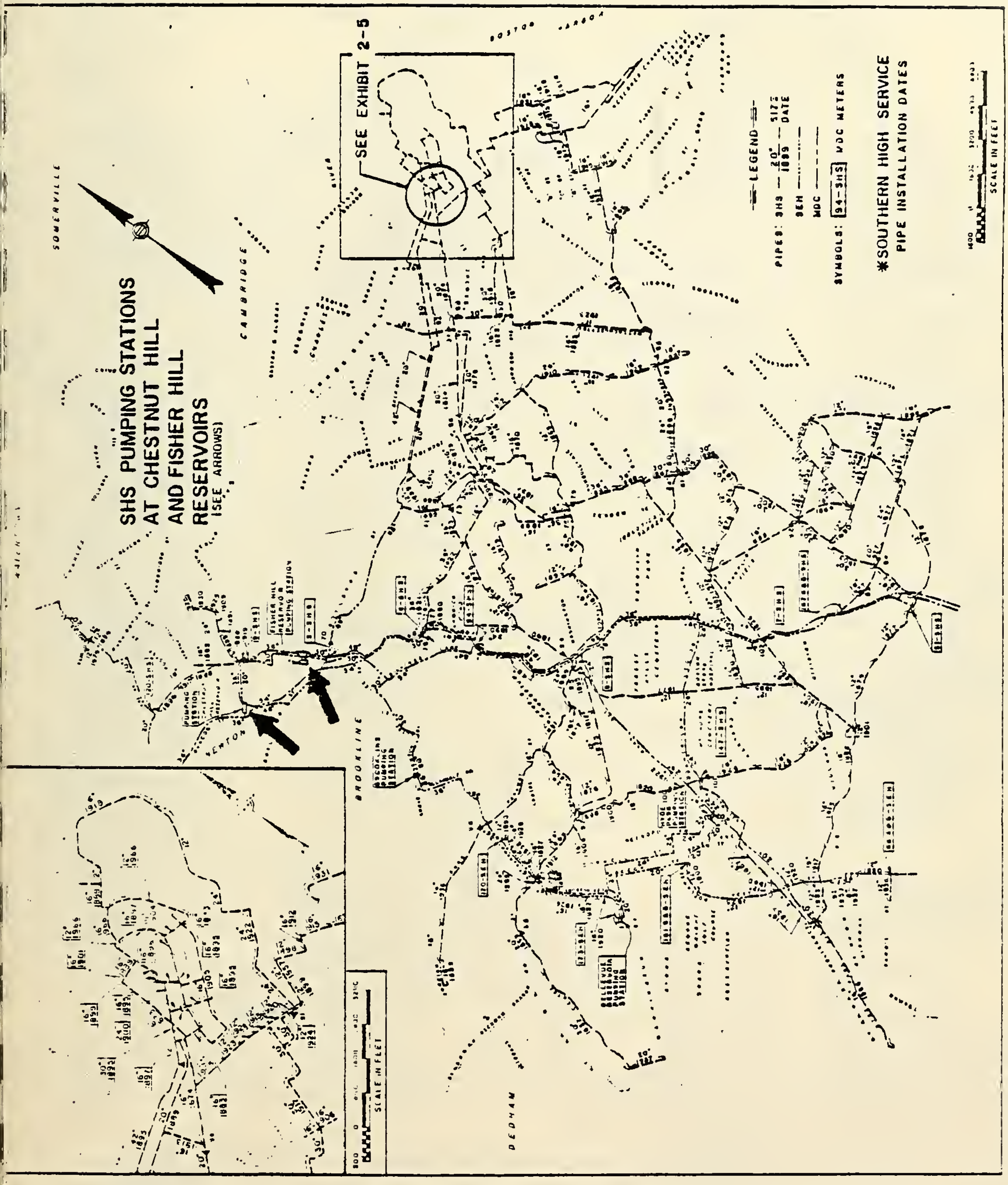
The MDC also admisisters a Sewer District which collects and treats sanitary and industrial wastes from some 43 metropolitan communities, including Boston. The system includes over 200 miles of intercepting and trunk sewers which collect discharges from nearby 5,000 miles of city and town sewers and deliver them to two major primary treatment facilities, located at Deer Island and at Nut Island. Eleven pumping stations with a total capacity of some 600 MGD are required to deliver these sewage flows to the treatment facilities, from which the treated effluent is discharged into the Atlantic Ocean through deep outfall lines.



BOSTON WATER FIGURE-DN3

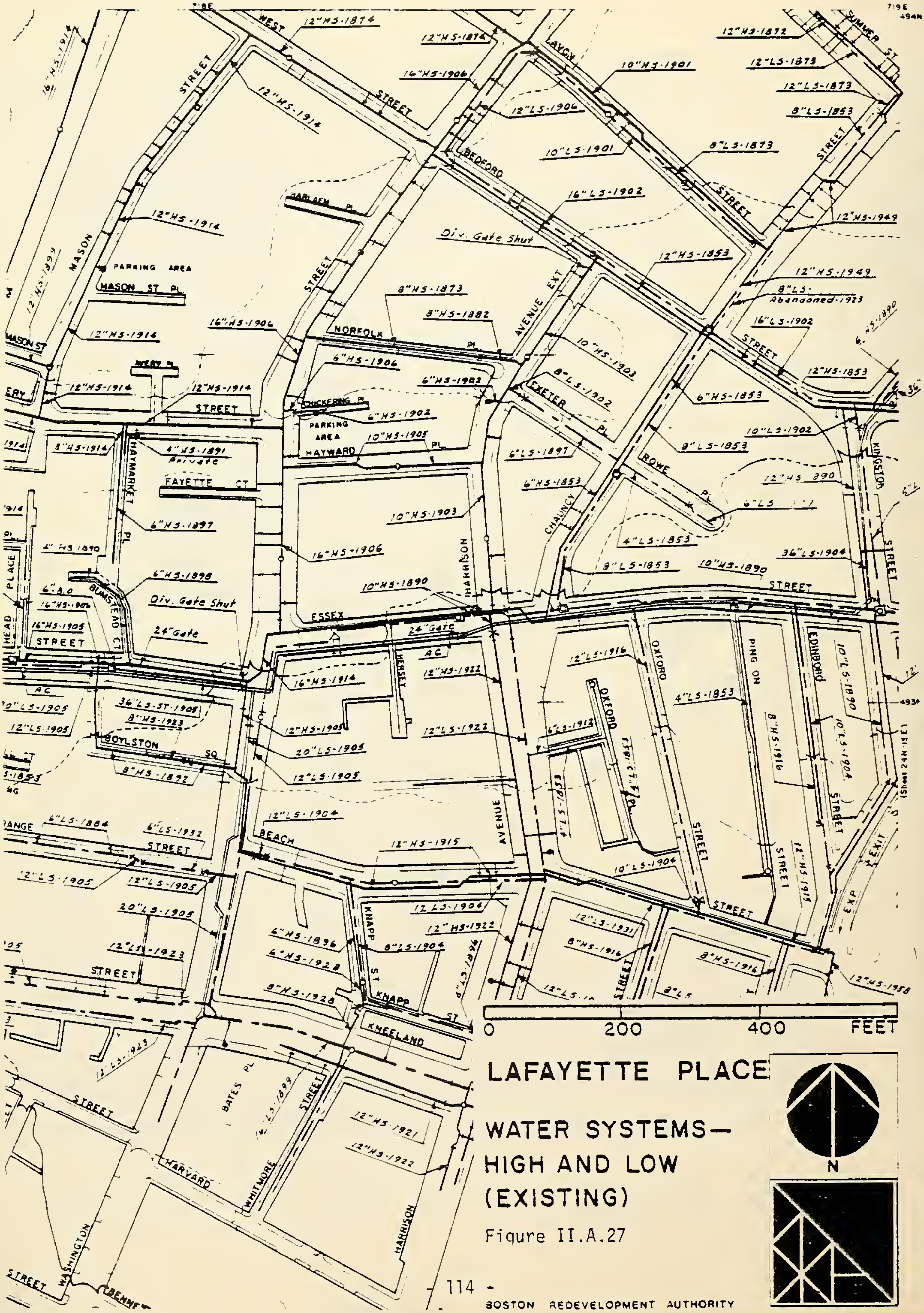
*EXCERPT FROM CITY OF BOSTON WATER DISTRIBUTION SYSTEM REPORT
FIGURE-DN3, SEPTEMBER 1967

Figure II.A.25 City of Boston Southern Low Service Water Distribution Service


SHS PUMPING STATIONS AT CHESTNUT HILL AND FISHER HILL RESERVOIRS (SEE ARROWS)
SEE EXHIBIT 2-5
SOMERVILLE
CAMBRIDGE
BROOKLINE
NEWTON
DEDHAM
BOSTON HARBOR
FISHER HILL RESERVOIR PUMPING STATION
LEGEND
PIPES: SHS — 20" 1889 — SIZE DATE
SEH
MDC
SYMBOLS: 94-SHS MDC METERS
*SOUTHERN HIGH SERVICE PIPE INSTALLATION DATES
SCALE IN FEET
FIGURE-DN4
BOSTON WATER

*EXCERPT FROM CITY OF BOSTON WATER DISTRIBUTION SYSTEM REPORT FIGURE-DN4, SEPTEMBER 1967

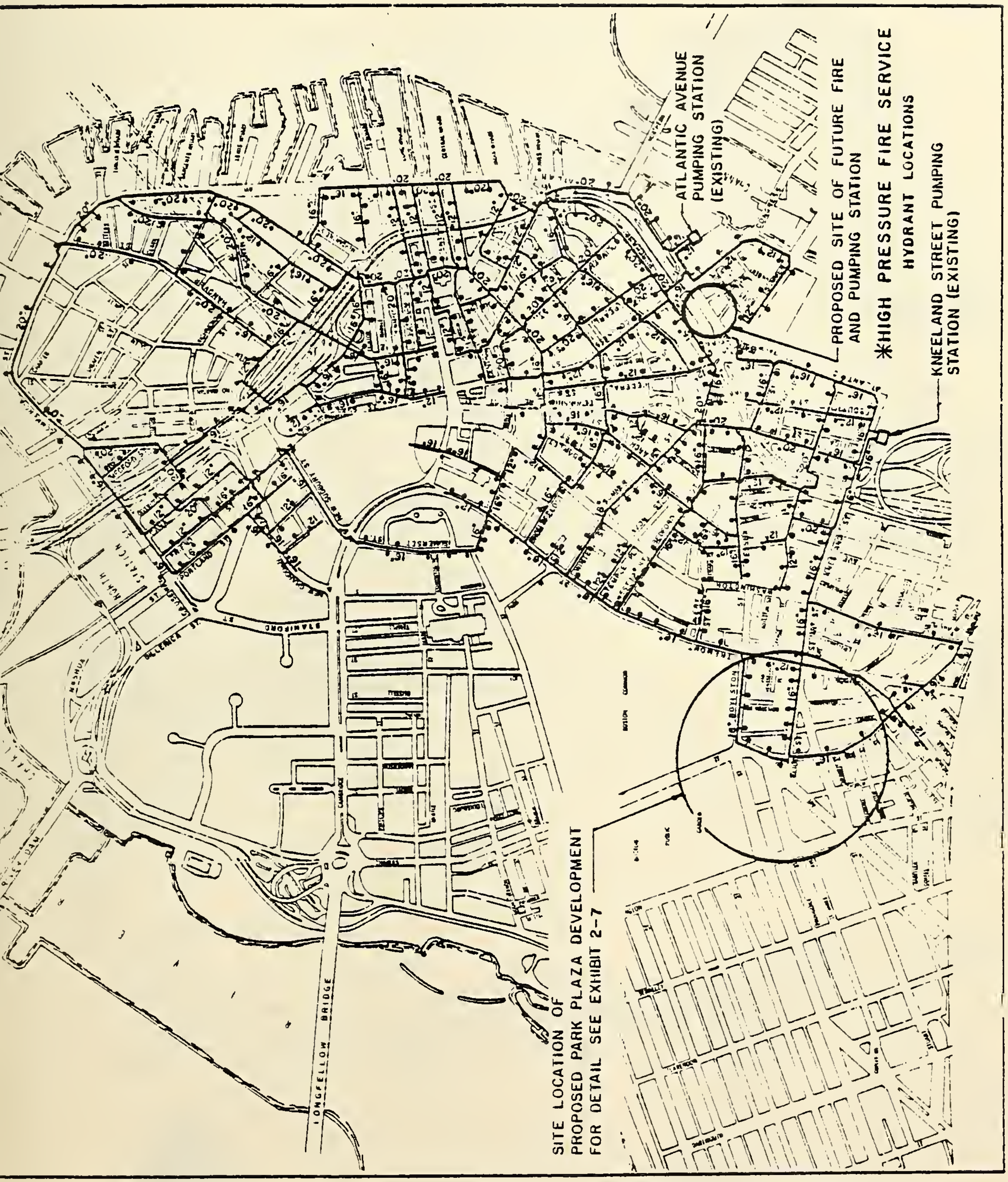
Figure II.A.26: CITY OF BOSTON SOUTHERN HIGH SERVICE WATER DISTRIBUTION SERVICE



LAFAYETTE PLACE

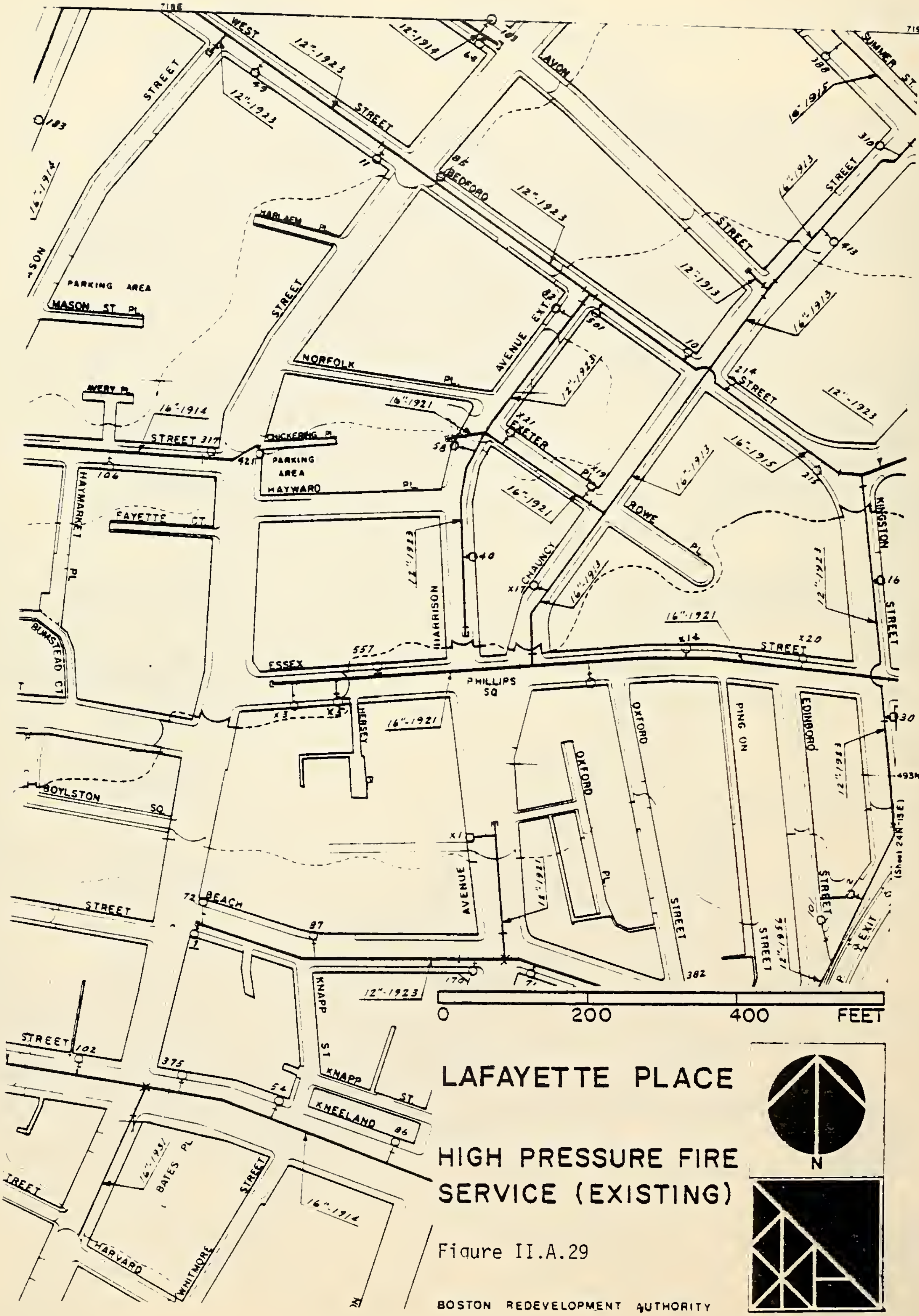
WATER SYSTEMS— HIGH AND LOW (EXISTING)

Figure II.A.27


ATLANTIC AVENUE PUMPING STATION (EXISTING)
PROPOSED SITE OF FUTURE FIRE AND PUMPING STATION
*HIGH PRESSURE FIRE SERVICE
HYDRANT LOCATIONS
KNEELAND STREET PUMPING STATION (EXISTING)
SITE LOCATION OF PROPOSED PARK PLAZA DEVELOPMENT FOR DETAIL SEE EXHIBIT 2-7
LONGFELLOW BRIDGE
BOYLSTON
PORTLAND
STANIFORD

BOSTON WATER
*EXCERPT FROM REPORT ON "CITY OF BOSTON WATER DISTRIBUTION SYSTEM",
FIGURE HPFS-1, PAGE 121, SEPTEMBER 1967

Figure II.A.28: CITY OF BOSTON HIGH PRESSURE FIRE SERVICE



LAFAYETTE PLACE

HIGH PRESSURE FIRE SERVICE (EXISTING)

Figure II.A.29

BOSTON REDEVELOPMENT AUTHORITY

The City of Boston operates a system of combined and separated sanitary and storm drainage sewers which discharge into the MDC system. The downtown area is served by the Boston Main Drainage System, which is a very old combined sewer system consisting of the Boston Main Interceptor, five branch interceptors, and outlet facilities (Figures II.A.30). From the project area, the existing combined system flows out to Kneeland Street (from Harrison Avenue Extension and Chauncy, Avon, and Bedford Streets) and Summer Street (from Washington Street); both of these discharge into the East Side Interceptor in Atlantic Avenue. The East Side Interceptor flows southward to the MDC headworks at Columbus Park (capacity 60 MGD), where sewage flows enter a deep rock tunnel (Boston Main Drainage Tunnel) under Boston Harbor to the Deer Island Sewage Treatment Plant. Dry weather flows are discharged directly into the Interceptor through regulators; excess storm flows from the project area are discharged into the Fort Point Channel through tide-gated outlet structures (Figure II.A.31).

Solid Waste Collection

Solid waste throughout the City of Boston is collected by private contractors under contract with the City. For the downtown area, the City has contracted with Charles Lee Disposal Co., Inc. for the collection of residential trash. The City does not provide for collection from commercial properties; collection is the responsibility of the individual property owners who must contract with private disposal companies. (For further details on solid waste collection, see Section C.2 below.)

Private Utilities

Boston Edison Company provides complete electrical services, as well as steam for heating purposes, to the project area. Other private utility systems serving the area include the Boston Gas Company and the New England Telephone Company. Conduits and transmission lines for one or more of these utilities are located in the streets within and abutting the project area.

Electrical Service

Electricity to the Lafayette Place site presently is supplied from substations which are fed from the Boston Edison Co. 115 KV transmission system. The two substations feeding the area are the new Kingston Street bulk sub-station and the Chauncy Street substation. Successive additions to the Kingston Street sub-station are planned in future years as the load demand grows, including the addition of a 345 KV system to augment the existing 115 KV system.

These sub-stations are fed by power generated at the New Boston Generating Station in South Boston, which is the closest station, and by the Mystic Station in Everett, the Edgar Station in Weymouth, and the Pilgrim Station in Plymouth. The South Boston, Everett and Weymouth Stations feed directly into the 115 KV transmission

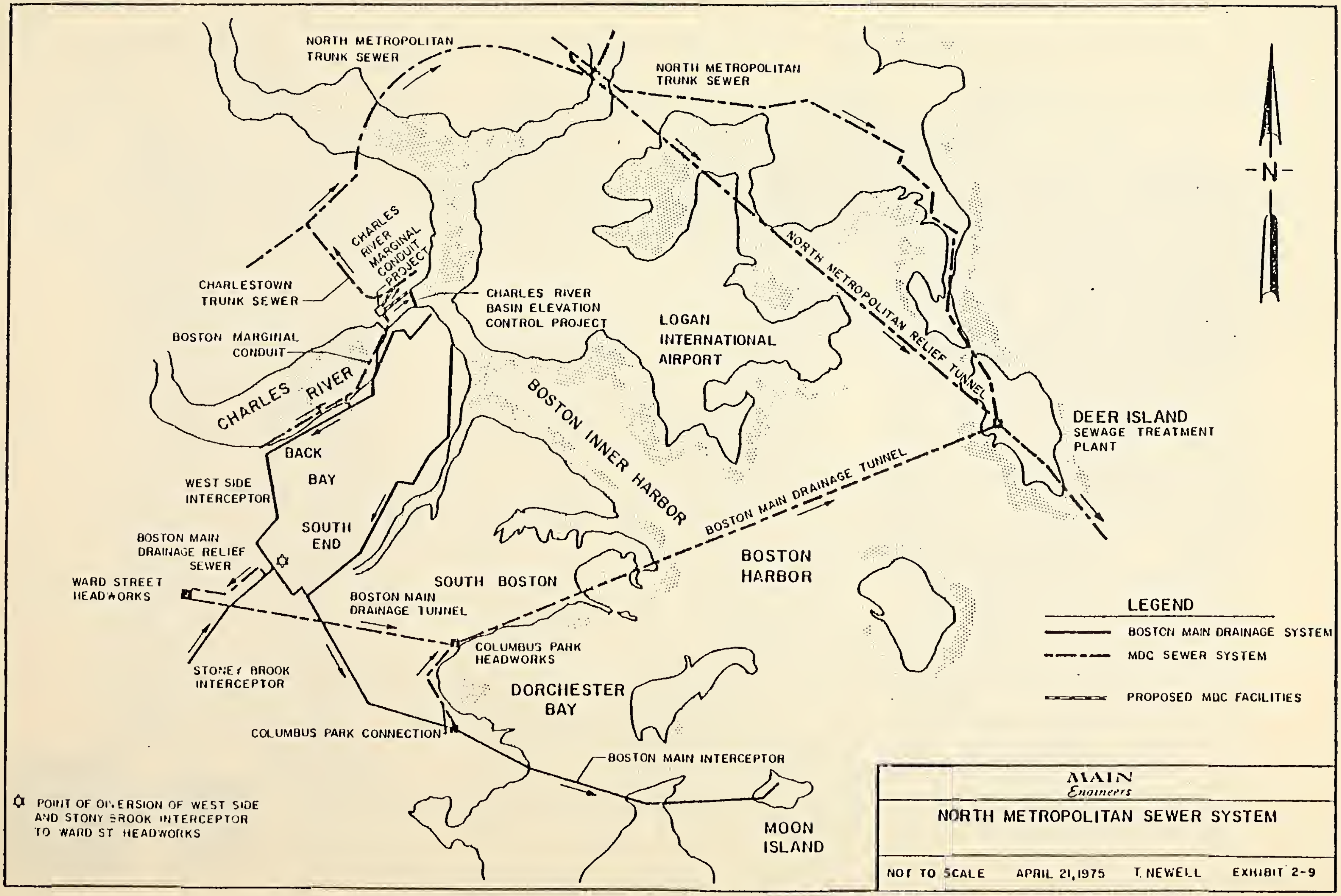
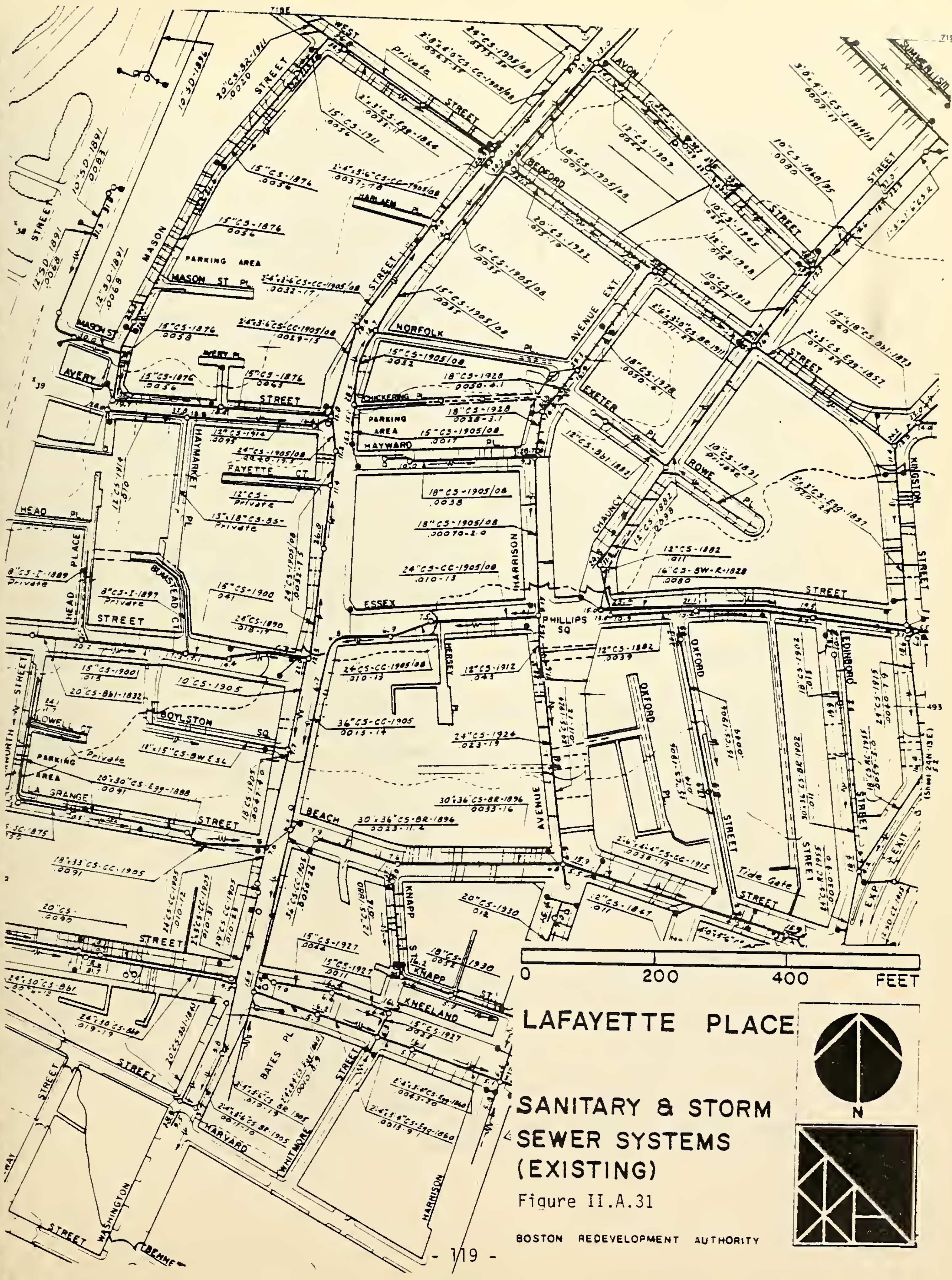

NORTH METROPOLITAN TRUNK SEWER
NORTH METROPOLITAN TRUNK SEWER
-N-
CHARLES RIVER MARGINAL CONDUIT PROJECT
CHARLESTOWN TRUNK SEWER
CHARLES RIVER BASIN ELEVATION CONTROL PROJECT
LOGAN INTERNATIONAL AIRPORT
NORTH METROPOLITAN RELIEF TUNNEL
BOSTON MARGINAL CONDUIT
CHARLES RIVER
BOSTON INNER HARBOR
DEER ISLAND
SEWAGE TREATMENT PLANT
BACK BAY
WEST SIDE INTERCEPTOR
SOUTH END
BOSTON MAIN DRAINAGE TUNNEL
BOSTON MAIN DRAINAGE RELIEF SEWER
BOSTON HARBOR
WARD STREET HEADWORKS
SOUTH BOSTON
BOSTON MAIN DRAINAGE TUNNEL
LEGEND
BOSTON MAIN DRAINAGE SYSTEM
MDC SEWER SYSTEM
PROPOSED MDC FACILITIES
COLUMBUS PARK HEADWORKS
STONEY BROOK INTERCEPTOR
DORCHESTER BAY
COLUMBUS PARK CONNECTION
BOSTON MAIN INTERCEPTOR
POINT OF DIVERSION OF WEST SIDE AND STONY BROOK INTERCEPTOR TO WARD ST HEADWORKS
MOON ISLAND
MAIN Engineers
NORTH METROPOLITAN SEWER SYSTEM
NOT TO SCALE
APRIL 21, 1975
T. NEWELL
EXHIBIT 2-9

Figure II.A.30 North Metropolitan Sewer System (MDC)

Source: Chas. T. Main, Inc., Environmental Impact Report of Public Utilities in the Proposed Park Plaza Development, Boston, June 1975



LAFAYETTE PLACE

SANITARY & STORM SEWER SYSTEMS (EXISTING)

Figure II.A.31

BOSTON REDEVELOPMENT AUTHORITY

system while the Plymouth Station feeds via a 345 KV system which is transformed to 115 KV in the southern part of the state at stations in Holbrook, Walpole and Medway.

The 115 KV and 345 KV systems are interconnected to all systems in Massachusetts and all the states contiguous to Massachusetts, and at any instant of time power can be supplied from any of the stations in the grid.

The prime source of fuel is oil, with nuclear power second. The new Boston Generating plant in South Boston, the Mystic Station in Everett, and the Edgar Station in Weymouth burn oil while the Pilgrim Station in Plymouth is nuclear. The sources of power from grid interconnections are coal, oil, and nuclear.

Steam Supply

Steam is supplied by Boston Edison to the project area primarily from the Kneeland Street Station near Atlantic Avenue and to a much lesser extent from the L Street Station in South Boston. With the recent addition of a fourth boiler, the Kneeland Street Station has a capacity of 1,150,000 pounds per hour. The primary souce of fuel is No. 6 (heavy) oil. The Kneeland Street Station can also burn natural gas a few months of the year in the off-peak season for Boston Gas Company.

Gas Service

Gas is supplied to the downtown area by the Boston Gas Co. through three plants: the Everett Plant, the Commercial Point Plant in Dorchester, and the Wellesley Meter Station. During the summer months the Algonquin Gas Transmission Co. supplies the Boston Gas Co. with natural gas which is piped into the Boston area from the southwest. This gas is partly used to supply customers and partly used to fill storage tanks. During the winter, which is the peak season, Boston Gas uses the gas stored in their tanks as well as gas being piped in to supply their customers. Boston Gas Co. also supplement their supply by bringing liquified natural gas by ship from Algeria and by manufacturing synthetic natural gas at their Everett Plant from propane.

Telephone Service

The New England Telephone Company has main duct feeders and subsidiary conduits installed in the project area. Service to the proposed Lafayette Place project can be provided from a distribution exchange located on Harrison Avenue at Essex Street.

New England Telphone also provides conduits in their ducts for the City's police signal system and fire alarm system. Both of these systems are considered to be adequate and in satisfactory condition by the respective departments.

b. Impact of the Proposed Project

Implementation of the Lafayette Place development project is not expected to place any undue strain on the existing public or private utility systems serving the area. Adequate lines and mains of sufficient capacity to service the needs of the new development presently exist in the surrounding streets and served previous high density development that formerly occupied the project site. This occupation consisted of department stores and other commercial buildings totalling nearly 1,200,000 square feet in area. The proposed Lafayette Place project, of some 1,000,000 square feet, should add no burden to the existing utility systems.

Four public ways will be discontinued as part of the project. These streets include Avon Street, Bedford Street between Washington and Chanucy Streets, Exeter Place, and part of Harrision Avenue Extension from Bedford Street to approximately Norfolk Place. All public and private utilities on these streets, except for those in Bedford Street, can be abandoned. The utilities in Bedford Street, which are major supply lines to the areas west of Washington Street, must be maintained or relocated at the expense of the Lafayette Place developer in order to accommodate the construction of the underground garage and pedestrian mall. Each utility relocation will be incorporated in the plaza construction after relocation plans have been approved by each City department and private utility company or will be relocated into the new east-west arterial. If any new utility lines are needed as part of this project, they also will be placed within the proposed east-west arterial street to avoid conflicts with existing systems.

During demolition of the Jordan Marsh Annex buildings, no disruption of existing utilities serving the City is expected. Some damage, however, may possibly be expected to the surrounding sidewalks; these will be replaced with new sidewalks (along Washington and Chauncy Streets) or be eliminated by the project itself.

Impact on Water Supply

At the present time, the project site has no water demand. With completion and full utilization of the Lafayette Place development, an average daily demand of 394,765 gallons of water is estimated.[1] Maximum daily demand is calculated at 150-200% of average daily demand, with a peak daily demand of 300% average. Since the City of Boston currently (1974) utilizes an average daily demand of 145 million gallons, the Lafayette Place development would increase total City demand by 0.27 percent.

---

[1] For the basis of this estimate, sse Appendix G.

As indicated above, maximum dependable safe yield from the present MDC sources is estimated at 300 MGD. As of 1975, however, the MDC was operating at 330 MGD, or 10 percent above the dependable safe yield. For 1990, the Massachusetts Water Supply Policy Study, using the latest Office of State Planning growth projections and 1975 Division of Environmental Health safe yields for each city and town, has estimated a MDC deficit of about 70 MGD. Boston's safe yield is estimated by the same study at 141.7 MGD, slightly below current demand. For 1990, the MWSP study projected an average daily consumption of 153.26 MGD and a maximum daily consumption of 161.01 MGD. The 1990 deficit for Boston, therefore, is 11.5 MGD (average usage).

In order to meet the projected demands, the MDC has established specific development programs. Two major projects under consideration to increase dependable safe yield include the Northfield Mountain Water Supply Project and the Miller's River Basin Project (Figure II.A.32). Under the Northfield Project, the Legislature has approved the diversion of water from the Connecticut River Watershed for MDC use. The planned completion date is prior to 1984 and the yield is estimated at 72 MGD. The second project, which would direct water from the Miller's River Basin, a tributory to the Connecticut River, could yield additonal supplies of from 48 MGD to 76 MGD, depending on the method of development employed. Implementation of both of these projects, therefore, would increase water supply capacity from 300 MGD up to 448 MGD by 1990.

The MDC also has underway a large scale investigation of the adequacy of the system's aquaducts. Improvements to the water conveyance systems are expected to maintain, and in some cases increase, the levels of pressures supplied to the City of Boston. As an example, the recent (1975) completion of the Dorchester Tunnel noticeably improved the pressures by approximately 10 psi in the Dorchester Southern high service distribution network. Although the mains serviced by the Dorchester Tunnel do not directly service the downtown, improvements in the water supply network are transferred by loops to the area. There is a high degree of interaction between the MDC and Boston distribution systems, and major changes in either system result in corresponding effects on the other.

The Lafayette Place project area is well served by High Pressure Fire Service lines, and the proposed development is not expected to overload the existing system. The separate HPFS has the capacity to deliver 6,000 gpm of water at a minimum pressure of 100 pounds per square inch (psi). The average pressure of the system is 150 psi during a normal fire demand. A maximum pressure of 200 psi is allowed in the system. The limit of 200 psi is based on the ability to manually control fire hoses with high pressures. The HPFS is used effectively with hand held lines of normal length and is also used in direct connection with the operation of mobile deck guns. The mobile equipment also contains its own high pressure pumping apparatus and when connected to SHS or SLS produces higher pressure.

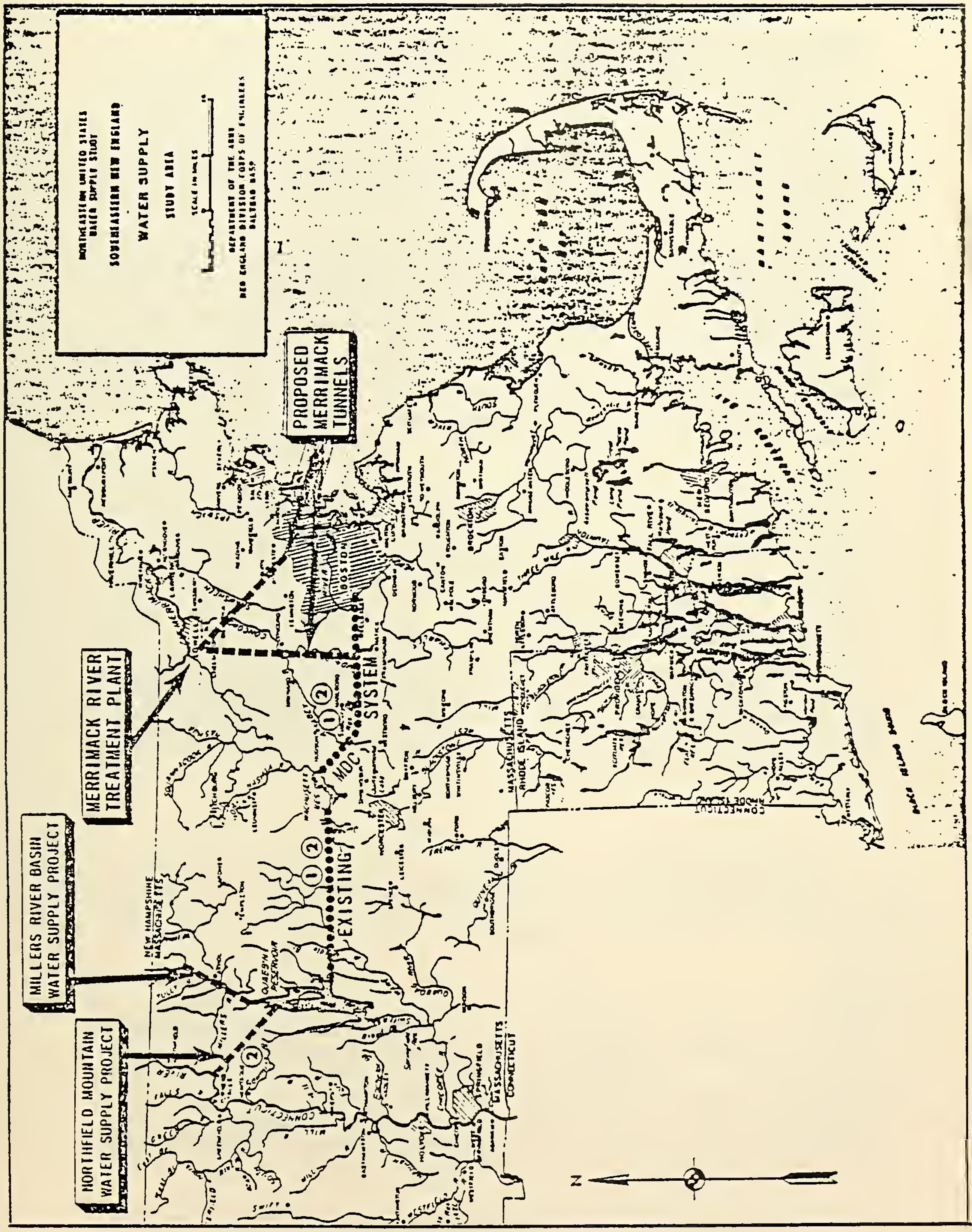

NORTHFIELD MOUNTAIN WATER SUPPLY PROJECT
MILLERS RIVER BASIN WATER SUPPLY PROJECT
MERRIMACK RIVER TREATMENT PLANT
PROPOSED MERRIMACK TUNNELS
EXISTING MDC SYSTEM
QUABBIN RESERVOIR
BOSTON
NORTHEASTERN UNITED STATES WATER SUPPLY STUDY
SOUTHEASTERN NEW ENGLAND
WATER SUPPLY
STUDY AREA
SCALE IN MILES
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION CORPS OF ENGINEERS
WALTHAM MASS
NEW HAMPSHIRE
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
N
1
2

Figure II.A.32 Proposed Additions to MDC Water Supply System for Metropolitan Boston

Impact on Sanitary and Storm Drainage Systems

The proposed project is expected to have little effect on either the dry-weather flows or the storm flows which will discharge into the existing combined drainage system. Although the site at present does not generate any sanitary sewage demands, it was at one time fully developed and adequately-sized pipes were available to serve the area.

The estimated sanitary sewage quanity to be generated by the project development in 1982 is similar to the water use, or approximately 394,765 gallons per day average and a triple peak flow rate. Sanitary sewage discharges from the project area into the East Side Interceptor, a 2'-8" x 4'-6" brick sewer which is scheduled for replacement by a new East Side Interceptor of 66 inches in size above Kneeland Street and 84 inches below Kneeland Street. The new interceptor would be considerably more than adequate to assume the additional discharges from the project area.

Since the project site is presently nearly totally paved or occupied with buildings, the proposed development will not add any impervious surfaces to the area. Therefore, storm drainage flows in the future should equal present flows and no additional burden would be placed on the system.

Impacts on Solid Waste Disposal

During the four-year development period, solid waste and debris will be generated by demolition, site preparation and excavation, and actual construction activities. Total solid waste generated during the construction phase is estimated at 199,240 cubic yards, or 328,222 tons, as follows:[1]

1.	Demolition debris:	59,070 cu. yds.	(124,047 tons)
2.	Excavation material:	136,670 cu. yds.	(239,850 tons)
3.	Construction debris:	3,500 cu. yds.	1,225 tons)
		199,240 cu. yds.	(365,122 tons)

Demolition and excavation debris will be generated during the first year of the project; construction debris during years 2-4.

Excavation material is a valuable commodity which can be sold to surcharge or fill land areas to prepare them for development. If a development site or sites are unavailable, disposal will have to take place at an approved landfill site. Certain demolition material also has potential reuse value, particularly brick, stonework, steel and wooden structural members, and other masonry and metal components. Much of this material can be recycled for further use or sold for scrap, thus reducing the amount of waste requiring disposal.

---

[1] For the basis of these calculations, see Appendix H.

Disposition of demolition and construction-related solid waste will be the responsibility of the contractors. Those wastes which are not recycled or otherwise reused will be required to be disposed of at disposition sites approved by the Commonwealth of Massachusetts. At the present time, only three landfill sites are available in the Boston area for demolition debris - one at Amesbury and two in Carver. These sites, however, are limited in their capacity. Some area incinerators, including the Resco in Saugus and municipal facilities in Braintree, Framingham, Reading, and Fall River, also may accept demolition debris. The Commonwealth currently has underway a study of potential sites suitable for solid waste disposal.

For a discussion of solid waste generation from project occupancy, see Section C.2 below.

Impact on Energy Resources

Because there are, at the present time, no definitive building plans upon which to base heat loss, heat gain, and specific energy requirements, very preliminary estimates of the energy consumption demand of the Lafayette Place project have been made based on certain assumptions and experience with similar type buildings.[1] For the Lafayette Place calculations, it has been assumed that heating and air conditioning will be supplied by the Edison steam system, as is the case with most major recent downtown development. Estimated electrical and steam demand are indicated on Table II.A.13 below.

Table II.A.13

Lafayette Place-Preliminary Energy Consumption Demands

	Electrical Demand*	Steam Demand
Hotel (500 rooms)	500 KW	15,000 lbs./hr.
Retail (300,000 sq. ft.)	1,200 KW	13,000 lbs./hr.
Underground garage (900 cars)	200 KW	5,000 lbs./hr.
Hayward Place garage (600 cars)	100 KW	
Street and exterior lighting	50 KW	
	2,050 KW	33,000 lbs./hr.

*Maximum KW demand

---

[1] Data furnished by Boston Edison Co. (personal communication with Commercial Department).

According to Boston Edison, these requirements can be easily met with existing facilities and more than adequate supply is available. The current (1975) downtown Boston business area load is approximately 700,000 KVA (or 560,000 KW at an overall power factor of 80%). Existing bulk power facilities are capable of supplying up to 1,000,000 KVA of load to the downtown area. Thus the Lafayette Place development would add only 0.29 percent increase to the total load. By 1985, however, Edison expects that downtown business area requirements could reach 1½ million KVA. To supply this need, Edison has constructed a new Kingston Street substation adjacent to the project site and has planned successive additions in future years as the load grows.

Peak summer electrical demand on the Edison system is estimated at 2,045 magawatts and peak winter demand 1,900 megawatts; by the year 1985, peak demand is projected to reach 3,340 megawatts (Summer) and 3,100 (Winter). The Edison's system capability currently is 3,124.8 megawatts and is projected to continue to rise steadily. Thus it is not expected that the addition of the project's electrical load would impose any strain on the Edison facilities.

Since Boston Edison is a participating member of the New England Regional Electrical Generating and Transmission Pool, which supplies electricity from some 55 generating plants located throughout New England, the increased demand on the Edison system cannot be specified to a particular plant but would be spread throughout the system and resultant air quality impacts would be insignificant. To meet future increased demands for electrical energy, Boston Edison plans the construction of a second nuclear power station at Plymouth.

The availability of energy resources in future decades cannot be projected with any accuracy at this time. The present sources of fuel for the stations in the grid network are coal, oil, and nuclear power. Fuel oil is a scarce resource, especially low-sulphur content oil, and as a result several stations have been converted to coal burning facilities. In addition, Boston Edison anticipates greater reliance on nuclear power in the future, from the present 30% to 50% by 1984.

Downtown steam capacity is likewise adequate to meet the needs of the Lafayette Place project without any difficulty or the need to add any new major piping or boiler capacity. Current maximum system capacity in the central area of Boston is 2,385,000 lbs.hr., and the maximum hourly demand, which occurred in January, 1977, is 2,042,000 lbs. The above comments concerning fuel availability apply similarly to Boston Edison's steam system.

At the present time, no gas service is anticipated to be required for the Lafayette Place development, although it is possible that some gas may be used for restaurant cooking facilities.

According to the project's architects, the Lafayette Place development is being designed to be energy efficient, and appropriate energy conservation measures are expected to be included in the final plans, beyond those required by Article 22 (Energy Conservation) of the State Building Code (a summary of the Code requirements is contained in Appendix I).

Impact of Telephone Service

In the opinion of the New England Telephone Co., the Harrision Exchange will have adequate capacity to handle the telephone requirements of the Lafayette Place project. At the present time, New England Telephone is in the process of cleaning out old ducts in the streets in the area in order to have space to handle the required cables. Therefore, the project will not adversely impact local or regional telephone service.[1]

---

[1] Telephone communication with Mr. William Spring, New England Telephone Co.

6. Air Quality

a. Background

Among other factors, the air quality of an area is directly related to the quantity of various pollutants emitted into the local atmosphere. Pollutants are emitted by both moving sources - vehicles, trains, etc. - and by stationary sources, such as power plants, industries, and the heating and mechanical systems of buildings. The principal pollutants generated by transportation sources are carbon monoxide (CO), unburned or partially-burned hydrocarbons (HC), oxides of nitrogen (NO_x), and particulate matter (TSP), the greatest quantity being contributed by gasoline-powered motor vehicles. Stationary sources produce principally sulfur dioxide (SO_2) and particulate matter; particulates also are generated by urban land uses such as incinerators, construction activities, and road dirt. Photochemical oxidants, a sixth major pollutant, are not directly emitted by any man-made source in significant quantities but rather are formed by a complex series of atmospheric reactions between hydrocarbons and oxides of nitrogen in the presence of sunlight. The principal reaction products are ozone (0_3) and Peroxyacetyl Nitrates (PAN).

Because the emission of pollutants degrades the quality of the ambient air and causes adverse health effects on human beings and their environment, the U.S. Environmental Protection Agency (EPA), pursuant to the Clean Air Act, promulgated air quality standards for the six airborne pollutants on April 13, 1971. These standards, shown on Table II.A.14, also were adopted by the Commonwealth of Massachusetts and represent maximum pollutant exposure for which no adverse effect to public health (primary standard) or welfare (secondary standard) will occur. The target date for attainment of national primary standards was May 31, 1975, and for secondary standards, within a reasonable time period. For metropolitan Boston, achievement of the primary standards subsequently was extended to May 31, 1977. With the recognition that these standards had not been attained nationwide, the Clean Air Act was amended in 1977 and required that the states submit revised implementation plans by 1979 for the attainment of air quality standards by December 31, 1982. In areas with severe carbon monixide or photochemical oxidant problems, where standards might not be attained by 1982 despite all reasonable efforts, under certain conditions an extension of the attainment deadline up to 1987 is possible.

In order to meet the air quality standards, the EPA promulgated controls and regulations respecting pollutant emissions from various sources, including the Federal Motor Vehicle Control Program (FMVCP) to limit motor vehicle emissions. Where these controls were inadequate to insure attainment or maintenance of ambient standards, more restrictive Transportation Control Plans (TCP) also were required.

Table II.A.14

MASSACHUSETTS AND FEDERAL AMBIENT AIR QUALITY STANDARDS

CONTAMINANT	AVERAGING TIME	TYPE OF AVERAGE	PRIMARY STANDARD AVERAGE CONCENTRATION		SECONDARY STANDARD AVERAGE CONCENTRATION	
			ugm/M^3	ppm	ugm/M^3	ppm
Sulfur Oxides (SO_2)	Year	Arithmetic Mean	80	0.03		
	Day	Maximum a	365	0.14		
	3 Hour	Maximum a	None	None	1,300	0.5
Total Suspended Particulates (TSP)	Year	Geometric Mean	75	--	60b	---
	Day	Maximum a	260	--	150	---
Carbon Monoxide (CO)	8 Hours	Maximum a	10 (Milligrams)	9	Same	Same
	1 Hour	Maximum a	40 (Milligrams)	35	Same	Same
Photochemical Oxidants (O_3)	1 Hour	Maximum a	160	0.08	Same	Same
Hydrocarbons (Non-Methane)	3 Hours	Maximum a,b Between 6 & 9 A.M.	160	0.24	Same	Same
Nitrogen Dioxide (NO_2)	Year	Arithmetic Mean	100	0.05	Same	Same

a) Federal standards other than annual average may be exceeded once per year.

b) A guide to be used in assessing implementation plans to achieve the 24-hour standard.

Since the EPA had determined that the FMVCP was not adequate to attain air quality standards in metropolitan Boston by the original applicable dates, a Transportation Control Plan was proposed in 1973 and was finally promulgated on June 12, 1975. The Plan is composed of a series of land use and transportation control procedures, which are summarized on Table II.A.15. Under the Plan, the goal was set to reduce hydrocarbons by 60% throughout the region and carbon monoxide by as much as 51% depending upon the locality. In general, two basic types of transportation controls were proposed: (1) measures designed to discourage vehicle use and reduce emissions by reducing the number of vehicle miles travelled (VMT) and (2) measures aimed at reducing emissions from individual motor vehicles. To date, only elements of the parking management program and commuter automobile use reduction elements of the Boston Control Plan have been implemented to any degree. For 1978, the EPA has indicated that the emphasis in Massachusetts will be the implementation of the inspection and maintenance program, which requires approval of the State Legislature. In addition, although the 1977 Amendments to the Clean Air Act eliminated EPA-mandated off-street parking restrictions, the Commonwealth and the City have continued the commercial off-street parking freeze element of the Plan for the central area of Boston and for Logan Airport.

b. Description of Existing Conditions

Boston Area Air Quality Levels

The Lafayette Place project site is located within the Metropolitan Boston Air Pollution Control District (APCD). The geographic limits of this district are shown in Figure II.A.33 and include 102 cities and towns in the metropolitan area. The emission of air contaminants in this area can be characterized from a 1973 source inventory study. These data represent an accounting of pollutant emissions classified by type of source, type of contaminant, and geographic area. Table II.A.16 shows in abstract form these data for the Metropolitan Boston APCD. The significance of these data is that 97 percent of carbon monoxide emissions, 62 percent of hydrocarbon emissions, and 47 percent of nitrogen oxide emissions are due to gasoline- and diesel-powered motor vehicles. Furthermore, gasoline-powered vehicles comprise the bulk of these emissions. The tabulations also indicate a component of automotive-related hydrocarbon emissions in the form of gasoline evaporation from bulk storage and marketing facilities for motor fuels.

Table II.A.15

SUMMARY OF THE REVISED METROPOLITAN BOSTON TRANSPORTATION CONTROL PLAN*

	Control Strategy	Projected Date of Full Implementation
I.	SEMI-ANNUAL INSPECTION/MAINTENANCE PROGRAM All Light- and Medium-Duty Vehicles (10,000 pounds gross vehicle weight or less)	August 1, 1976
II.	PARKING MANAGEMENT PROGRAM	
	A. Morning On-Street Parking Ban**	March 1, 1977
	B. Commercial Off-Street Parking Freeze***	October 15, 1973
	C. Restrictions on Construction or Modification of Parking Facilities	†
III.	COMMUTER AUTOMOBILE USE REDUCTION	
	A. Mandatory Incentive Measures by Commuter-Attracting Facilities†† to Reduce Single-Passenger Commuting Vehicle Usage by 25%	June 30, 1976
	B. Commuter Carpool Matching Program	June 30, 1975
	C. Feasibility Study of Preferential Bus and Carpool Incentives	December 31, 1976
	D. Study of Improved Bicycle Pathways and Facilities	June 30, 1976
IV.	CO "HOT SPOT" CONTROL STRATEGIES	May 31, 1977
V.	ORGANIC SOLVENT USE REGULATIONS	May 31, 1977

---

* Includes amendments proposed by EPA on June 12, 1975 [40FR25152, 40CFR52]. All regulations refer to the Metropolitan Boston Intrastate Air Quality Control Region unless otherwise noted.

** Applies only to Boston proper and the City of Cambridge.

*** Applies only to the "freeze area" of Boston, the City of Cambridge, and Logan International Airport.

† Reserved pending promulgation of final parking management regulations.

†† Employers with a facility having 50 or more employees and educational institutions with 250 or more commuting students and employees.

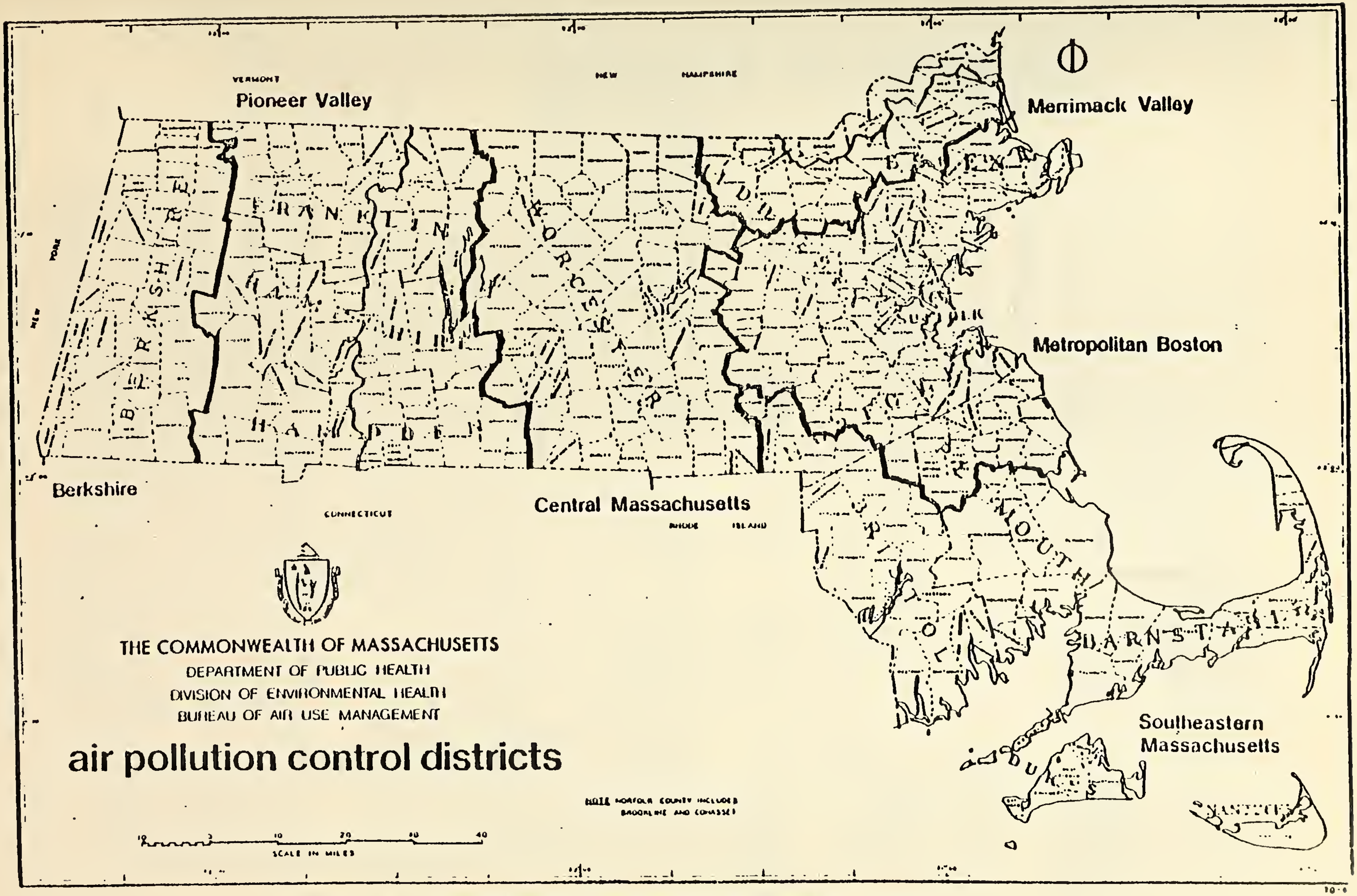


Figure II.A.33: MASSACHUSETTS AIR POLLUTION CONTROL DISTRICTS

Table II.A.16

Summary of Pollutant Emissions in the Metropolitan Boston APCD (1973)

Source	Pollutant (1,000 tons/year) Carbon Monoxide	Hydrocarbons	Nitrogen Oxides
Stationary Sources	20	103	107
Transportation Sources			
Automobile	965	151	79
Diesel	5	2	12
Other*	13	16	3
TOTAL	1,012	272	202

* Railroads, vessels, gasoline marketing, aircraft

The basis for determining whether air quality levels are in compliance with standards is data collected from monitoring stations operated by the Massachusetts Air Surveillance Network throughout the metropolitan Boston area. The nearest operating station to the Lafayette Place area is located at the J.F.K. Federal Building in Government Center. Most current air quality data available from this and other Boston area stations are summarized on Table II.A.17. Observed data from the J.F.K. Building indicated that, of the three pollutants monitored (particulates, sulphur dioxide, and nitrogen oxides) none of the primary or secondary standards were exceeded during the measuring period. Particulate levels throughout the Boston area are high, however, and violations of primary and secondary standards have been measured at other sites. The problem, however, is not localized due to a specific source but is a result of many urban activities such as incineration, construction activities, and road dirt throughout the metropolitan area.

Sulphur dioxide clearly does not present a problem in the Boston area, as measurements at the monitoring stations consistantly have been substantially below pollution levels. Nitrogen dioxide emissions also are not considered a problem. Although standards have been exceeded at some sites, the measurements and method of analysis have been seriously questioned and are considered unreliable by the EPA. The fact that the EPA has not promulgated any control strategy designed specifically to meet the NO_2 standard suggests that the EPA does not feel there exists any danger from NO_2 in the Boston area. A short-term standard, however, is being considered by the EPA.

Table II.A.17

AIR QUALITY MEASUREMENTS - BOSTON AREA MONITORING STATIONS[1]

Total Suspended Particulates (ugm/M^3)
(Oct. 1976 - Sept. 1977)

Station	Annual Geometric Mean[1]	Max. 24 Hr. Conc.[2]	# Times Primary Standard Exceeded	# Times Secondary Standard Exceeded
J.F.K. Federal Bldg.	50	99	0	0
South Bay	57	121	0	0
Kenmore Square	83	305	8	2
Science Park	55	115	0	0

---

[1] Primary standard = 75 ugm/M^3, Secondary = 60 ugm/M^3
[2] Primary standard = 260 ugm/M^3, Secondary = 150 ugm/M^3

Sulphur Dioxide (ppm)
(Oct. 1976 - Sept. 1977)

Station	Annual Arithmetic Mean[1]	Max. 24 Hr. Conc.[2]	Max. 3 Hr. Conc.[3]	# Times Standards Exceeded
J.F.K. Federal Bldg.	.007	.013	N.A.	0
South Bay	.010	.026	N.A.	0
Kenmore Square	.020	.079	.129	0
Science Park	.011	.053	.100	0

---

[1] Standard = .03 ppm
[2] Standard = .14 ppm
[3] Standard (Secondary) = .5 ppm

Nitrogen Oxides (ppm)
(Oct. 1975 - Sept. 1976)

Station	Annual Arithmetic Mean[1]	Max. 24 Hr Conc.[2]
J.F.K. Federal Bldg.	.033	.085
South Bay	.038	.069
Kenmore Square	.046	.111
Science Park	.036	.064

---

[1] Standard = .060 ppm
[2] No Standard

[1] Source: Massachusetts Air Surveillance Network and Massachusetts Bureau of Air Quality Control, "Monthly Summary of Continuous Data".

Table II.A.17 (cont'd)

Carbon Monoxide (ppm)
(Jan. - Dec. 1975)

Station/Month	Max. 1 Hr. Conc.[1]	# Times Standard Exceeded	Max. 8 Hr. Conc.[2]	# Times Standard Exceeded
Kenmore Square				
Jan.	22	0	14.0	102
Feb.	19	0	14.0	52
Mar.	15	0	11.3	9
April	10	0	8.3	0
May	11	0	8.6	0
June	11	0	7.9	0
July	15	0	8.3	0
Aug.	13	0	10.0	5
Sept.	18	0	11.9	15
Oct.	16	0	10.9	7
Nov.	16	0	11.1	18
Dec.	14	0	11.4	18
Science Park				
Jan.	8	0	5.8	0
Feb.	13	0	7.4	0
Mar.	10	0	5.8	0
April	10	0	6.3	0
May	10	0	5.6	0
June	8	0	4.1	0
July	7	0	4.9	0
Aug.	8	0	5.6	0
Sept.	9	0	5.4	0
Oct.	12	0	7.3	0
Nov.	13	0	6.6	0
Dec.	10	0	7.5	0

---

[1] Standard = 35 ppm

[2] Standard = 9 ppm

Table II.A.17 (cont'd)

Ozone (ppm)
(Jan. - Dec. 1975)

Month	Kenmore Square		Science Park	
	Max. 1 Hr. Conc.	# Times Standard Exceeded[1]	Max. 1 Hr. Conc.	# Times Standard Exceeded[1]
Jan.	.023	0	.039	0
Feb.	.025	0	.060	0
Mar.	.027	0	.055	0
April	.047	0	.100	2
May	.080	0	.126	20
June	.073	0	.158	37
July	.109	4	.118	22
Aug.	.090	4	.117	15
Sept.	.085	1	.056	0
Oct.	.039	0	.063	0
Nov.	-	-	.041	0
Dec.	-	-	-	-

---

[1] Standard = 0.08 ppm

Levels of carbon monoxide and photochemical oxidants exceed Federal and State standards throughout the City. At both the Kenmore Square and Science Park monitoring stations (which are physically the closest monitoring stations of these pollutants to the Lafayette Place site) the one-hour ozone and eight-hour CO standards (Kenmore Square station only) frequently have been exceeded, although the one-hour CO concentration has been well below the standard in recent years. Carbon monoxide, however, is highly sensitive to location. In a 1972 study prepared for the EPA,[1] estimates of maximum eight-hour ambient carbon monoxide levels in downtown Boston in 1970 ranged from 0.6 ppm (North End) to 20.7 ppm (Government Center); in the project area levels were estimated at 15.6 ppm, some 73% in excess of the standard. Since 1970, however, efforts to control auto exhaust emissions through the Transportation Control Plan are expected to have reduced these pollution levels. (The same study predicted that 8-hour maximum CO levels in the vicinity of the project area would be reduced to 9.0 ppm in 1977 and to 6.1 ppm in 1978 without any control strategies (other than vehicular pollution controls) and to 4.9 ppm in 1977 with implementation of the recommended Transportation Control Plan strategies.)

In summary, based on data from the area's monitoring stations, the EPA considers the Boston urbanized area to be an attainment area with respect to sulphur dioxide and nitrogen oxides and a non-attainment area for primary (health) standards for particulates, ozone, and carbon monoxide.

Project Area Air Quality Levels

Since the Lafayette Place project site is located in the heart of downtown Boston, in an area of generally narrow and heaveily travelled streets, ambient air quality in the vicinity of the site is typically more polluted than in the metropolitan area as a whole. Like many urban centers, the existing air quality reflects the extensive automobile congestion in the area (generating carbon monoxide, hydrocarbon, and ozone emissions), urban use (adding particulates of dust and ash and other substances) and the heating of buildings and other structures in the area (which produces the nitrous oxides, sulfates, and like emissions). The principal source of pollution, however, is motor vehicle activity. The manner in which the traffic flows (i.e., smooth flow vs. stop-and-go movement) critically influences emission factors. The highest levels of CO and HC are produced under accelerating and decelerating conditions, while emission levels are lowest under smooth flow conditions. Since many of the streets bordering or in the vicinity of the project area are congested at times with slow-moving traffic, pollution levels are generally high. In addition, the high buildings around the project site, ranging up to twelve stories, produces a "canyon" effect which results in higher concentrations of existing pollutants within the street network. (This is less of a problem at the present-day project site since it is almost entirely vacant land, allowing pollutants to disperse more rapidly.) The problem of an high concentration is particularly evident at sidewalk level, especially when traffic is idling or stop-and-go; it is of relatively minor importance to building occupants who are normally protected by air conditioning.

---

[1] U.S. Environmental Protection Agency, Transportation Controls to Reduce Motor Vehicle Emissions in Boston, Massachusetts (APTD-1442), Research Triangle Park, December, 1972.

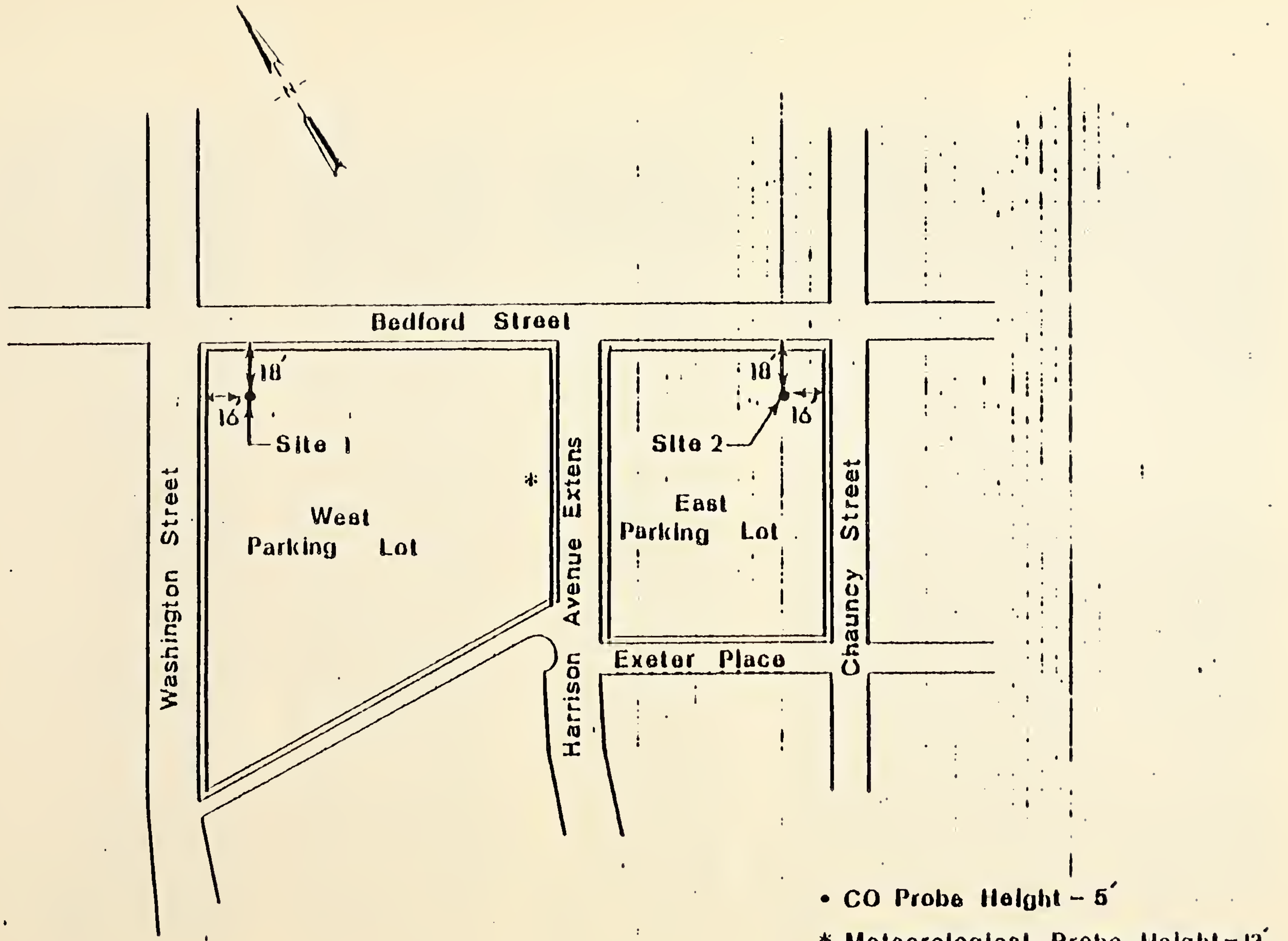
In order to determine existing ambient and background carbon monoxide concentrations in the general vicinity of the project site, a short-term air quality monitoring program was undertaken by Parsons Brinckerhoff Quade and Douglas, Inc., on March 29-30, 1978. Monitoring was undertaken for one-hour periods during peak and off-peak traffic periods at two locations within the site (see Figure II.A.34). Site one was located in the west (Bedford-West) parking lot southeast of the Washington-Bedford Streets intersection and site two was situated in the east (Bristol Block) parking lot, with the probe positioned southwest of the Chauncy-Bedford Streets corner. During the monitoring program, carbon monoxide concentrations, wind speed, and wind directions were measured. A description of the monitoring and meteorological equipment is given in Appendix J.

The results of the monitoring program are summarized in Table II.A.18, which indicates that ambient levels in the area are lower than might be expected with the generally heavy traffic volumes on Washington Street and the existence of active parking lots at the site. Measured concentrations ranged from 2.8 ppm at site two to 7.2 ppm at site one, both measured at off-peak hours. Concentrations, then, were between 8% and 20% of the one-hour standard of 35 ppm.

In general, wind speed and direction were influenced to a degree by the high buildings that surround the proposed site. At site one there was a pronounced airflow coming from the west, down Bedford Street. This airflow caused the pollutant emission from Bedford and Washington Streets to flow into the parking lot, a condition which existed during all the monitoring at this site. At site two, the wind varied from calm to slight gusts coming from the west-southwest, and the airflow seemed to be less effected by the surrounding buildings at this site.

Average CO concentrations did not vary to any great degree between peak and off-peak traffic periods. The one exception to this was the off-peak period at Site one. Judging from the number of cars in the parking lot on Wednesday versus Thursday, it appeared that Wednesday is a popular shopping day in the area. This high CO concentration relative to the other monitoring time periods seemed to be due to this large number of shopping-related traffic.

The CO concentrations at Site two seemed to represent background concentrations more than concentrations being emitted from Chauncy Street or Bedford Street. As shown by the results, the wind



• CO Probe Height – 5′

* Meteorological Probe Height – 13′

Figure II.A.34:
LOCATION OF CO PROBES AND METEOROLOGICAL EQUIPMENT – LAFAYETTE PLACE AMBIENT AIR QUALITY SURVEY

Source: Parsons, Brinckerhoff, Quade & Douglas, Inc., "Lafayette Place Air Quality Monitoring Study", April 1978, Figure 1

Table II.A.18

RESULTS OF CO MONITORING PROGRAM
LAFAYETTE PLACE PROJECT SITE

SITE	DATE	TIME	PERIOD	MEASURED CO CONCENTRATIONS (PPM)*	AVERAGE WIND SPEED (MPH)	AVERAGE WIND DIRECTION (DEGREES)
1	3/29/78	2:15 - 3:15 PM	Off-peak	7.2	4.0	170
1	3/29/78	4:15 - 5:15 PM	Peak	5.6	4.5	180
2	3/29/78	5:30 - 6:30 PM	Peak	4.2	3.5	190
2	3/30/78	11:30 - 12:30 PM	Off-peak	3.4	4.0	240
2	3/30/78	2:20 - 3:20 PM	Off-peak	2.8	3.0	220
2	3/30/78	4:10 - 5:10 PM	Peak	3.4	2.5	210
1	3/30/78	5:30 - 6:30 PM	Peak	4.9	4.5	240

* This value represents the average carbon monoxide concentrations for a one hour period.

Source: Parsons, Brinckerhoff, Quade & Douglas, Inc., "Lafayette Place Air Quality Monitoring Study", April 1978, Table 1 tended to come from the south and southwest, which caused the pollutants from Bedford and Chauncy Streets to be forced downwind of the CO probe.

During the same period, the Commonwealth of Massachusetts, Division of Air and Hazardous Materials, also undertook CO measurements at its offices at 600 Washington Street, one block from the Lafayette Place project site. Data was accumulated over a 12 day period during the latter half of April, 1978, and the CO was measured using an electrochemical analyzer. It should be noted, however, that this sampling was not an official measurement program, a non-equivalent procedure was used, and the sampling probe location (at a height of approximately 30 feet above street level) did not conform to existing EPA guidelines. Nonetheless, it is believed that this set of measurements can give a general indication of existing CO levels in the downtown. Measured data form the DAHM site indicated that 1-hour CO levels ranged from a low of 1 ppm to a maximum of 12 ppm, with the majority of the readings around 1-4 ppm (which are somewhat less than the PBQ&D site monitoring program).

Analysis of the State data indicates that the highest 8-hour average during this period was 7.9 ppm, which is below the 8-hour standard of 9 ppm. However, based on these limited results and data compiled at other Boston-area monitoring stations, and on discussions with officials of the EPA, Region I, and the Massachusetts DAHM, it is anticipated that while the existing CO will not exceed the 1-hour CO standard of 35 ppm, the 8-hour average level most likely would exceed the corresponding 9 ppm standard in the downtown area.

Major stationary sources of air pollution in and near the project area are the heating and mechanical systems of individual buildings, and the nearby Kneeland Street Steam Plant of Boston Edison Company. However, information provided by the Massachusetts Division of Air and Hazardous Materials indicates that the Edison plant in itself does not violate any air quality standards. Since these sources are the principal emitters of sulfates and nitrogen oxides and existing monitoring data do not indicate any problems in the Boston area, it may be concluded that the project area is not currently endangered by stationary source emissions. These observations are substantiated by the fact that the EPA does not consider Metropolitan Boston a non-attainment area with respect to SO_2 and NO_x.

c. Impact of the Proposed Project

The impact of the Lafayette Place development on air quality will occur both in the short-term (during the project construction period) and in the long-term, resulting from project operation. During the latter period, impacts will be due primarily to the generation of vehicular traffic by the retail/hotel complex and to the exhaust of the building mechanical equipment.

Construction-Related Air Quality Impacts

Short-term adverse impacts on air quality will occur during the four-year construction period and result primarily from building demolitions, land clearance and excavation, construction activities, and emissions from construction equipment and trucks.

The most significant impact would be substantial increases in the amount of particulate matter, or fugitive dust, released into the atmosphere, as a result of demolition, loading of the rubble into trucks and grading of the vacant site, and from the movement and hauling of dirt during land clearance, site preparation, and excavation operations. Based on a previous study of demolition in the Boston area,[1] it is estimated that the proposed demolition of 5,316,633 cu. ft. of buildings on the site could produce a maximum total of 415.6 tons of particulate matter. In addition, it is estimated that land clearance and excavation activities will involve the movement of approximately 136,670 cu. yds. of earth, which would add an estimated 223.3 tons of dust to the atmosphere (based on EPA emission factor of 4 lbs./cu. yd.). These amount of dust would be added to ambient particulate levels, which levels, as noted above, are already high in the Boston area and do violate standards.

Since all of the proposed demolition and land clearance and excavation activities is scheduled for the first year of development, the average maximum increase in particulate matter from these activities could reach to approximately 53.2 tons per month. When compared to the estimated dustfall for the City of Boston of 45 tons per square mile per month, the dustfall from this project would represent a significant increase over ambient conditions in the vicinity of the project area.

The above figures assume no control of dust during demolition and construction operations. With the use of extensive or continuous wetting (use of water spray) throughout the demolition and rubble-removal process, however, dust levels can be reduced by as much as 80%. Average control (intermittant wetting, with the most intensive wetting occuring during the actual razing of a structure) can result in a 50% reduction of dust generation. Also, the watering down of exposed ground areas and the application of chemical compounds, such as calcium chloride, can substantially reduce dust during the land clearance and excavation phases. It should be noted, however, that the expected particulate problem is common for construction projects of the size comtemplated and should not be considered unique to this project.

---

1. Resource Planning Associates, Inc., Final Environmental Impact Statement for the Clearance of Unsafe Building, Community Development Block Grant Program (City of Boston), Cambridge, Mass., January, 1976. According to this study, demolition of a brick structure would produce 6.7 lbs. of dust per ton of demolition waste. Total demolition weight of the buildings to be demolished is estimated at 124,047 tons.

Although the values indicated above are high, even with extensive control, the significance of the impact would be tempered by several considerations. The Boston demolition study found that approximately 90% of demolition - generated particulate matter settled to the ground in the immediate vicinity of the demolition site and was not dispersed into the atmosphere, the dust plume created generally being impeded both horizontially and vertically by the presence of neighboring buildings. Thus the greatest impact would be confined generally to receptors near the demolition activities and most likely would involve the soiling of exterior surfaces as well as affecting pedestrians in the immediate vicinity of the project site. Moreover, evaluation of particle size indicated that only 10% of the particulates were 10 microns or smaller in diameter, which size is respirable and thus could be hazardous to human health. The same characteristics would apply equally to fugitive dust from excavation activities. The impact of dust generation also would be minimized to some extent by the fact that a much lesser concentration of pedestrians is found south of Avon Street than in the retail core.

Some additional particulate matter will be generated as a result of the actual construction process itself. The amount that might be produced cannot be accurately estimated but is expected to be considerably less than that resulting from demolition and excavation activities.

Asbestos, which has been found to be extremely dangerous to health, possibly may be present in a friable, or free-floating, state as insulation or fire proofing material in some of the buildings planned for demolition. Where present, procedures as outlined in the National Emission Standards for Asbestos will be enforced to minimize any potential adverse impacts.

Air quality also will be impacted by increased gaseous emissions from heavy- and light-duty trucks, from gasoline- and diesel-operated construction machinery, and from street paving operations. These equipment would generate primarily carbon monoxide, hydrocarbons, and nitrogen oxides, with lesser amounts of sulfur oxides and particulates (see Table II.A.19), which would be spread over the 4 year construction period estimated for the proposed development. The amount of the pollutants which might be generated would be dependant on the number of trucks and equipment in operation at one time.

Traffic-Related Air Quality Impacts

The major long-term impact on ambient air quality resulting from development of the Lafayette Place project will be due to vehicular traffic generated by the retail/hotel complex, which for the most part will be related to the proposed 900-car underground garage and the renovated Hayward Place garage. Since the latter operates today, the impact of continued use of this parking facility would be included in current ambient conditions. Consequently, the net impact of the Lafayette Place project generated traffic on air

Table II.A.19: Emission Factors for Heavy-Duty Vehicles and Construction Equipment

(1) Heavy-Duty Construction Equipment (Miscellaneous Category)[1]
(1,000 hours/year annual operation)

	Diesel-Powered ($lbs./10^3$ gal)	Gasoline-Powered ($lbs./10^3$ gal)
CO	94.2	3,960
HC	34.7	130
NO_x	494	95.8
SO_x	31.1	5.28
TSP	30.1	6.06

(2) Heavy-Duty Vehicles[2]

	Diesel-Powered (g/mi)	Gasoline-Powered (g/mi)
CO	20.4	130
HC	3.4	13
NO_x	34	9.2
SO_x	2.4	.25
TSP	1.2	.65

---

[1] U.S. Environmental Protection Agency, Compilation of Air Pollution Emission Factors (AP-42), Second Edition, Research Triangle Park, March 1975, Table 3.2.7-1, 3.2.7-2.

[2] Ibid, Tables 3.1.4-1, 3.1.5-1.

quality would be associated primarily with the proposed underground garage. To determine this impact, an impact analysis of the garage-related traffic was completed by Bolt Beranek and Newman, Inc., and is attached as Appendix K.

The analysis involved an estimation of carbon monoxide levels at the two entrances/exits to the garage and at six major intersections in the vicinity of the garage. Traffic data used in the analysis were provided by the BRA and were based on the assumption that the Transit and Traffic Improvement Program would be implemented and in operation at the time the garage would open.[1] The general procedure for the analysis followed the latest EPA guidelines for evaluating indirect sources utilizing estimated automotive emission factors from the most recent data contained in EPA's MOBILE I computer program.

The eight intersections selected for analysis included the following:

- Chauncy St. Exit/Entrance
- New street Exit/Entrance
- Chauncy Street and new street
- New and Washington Streets
- Bedford and Kingston Streets
- New, Essex, and Kingston Streets
- Phillips Square
- Kneeland and Harrison Streets

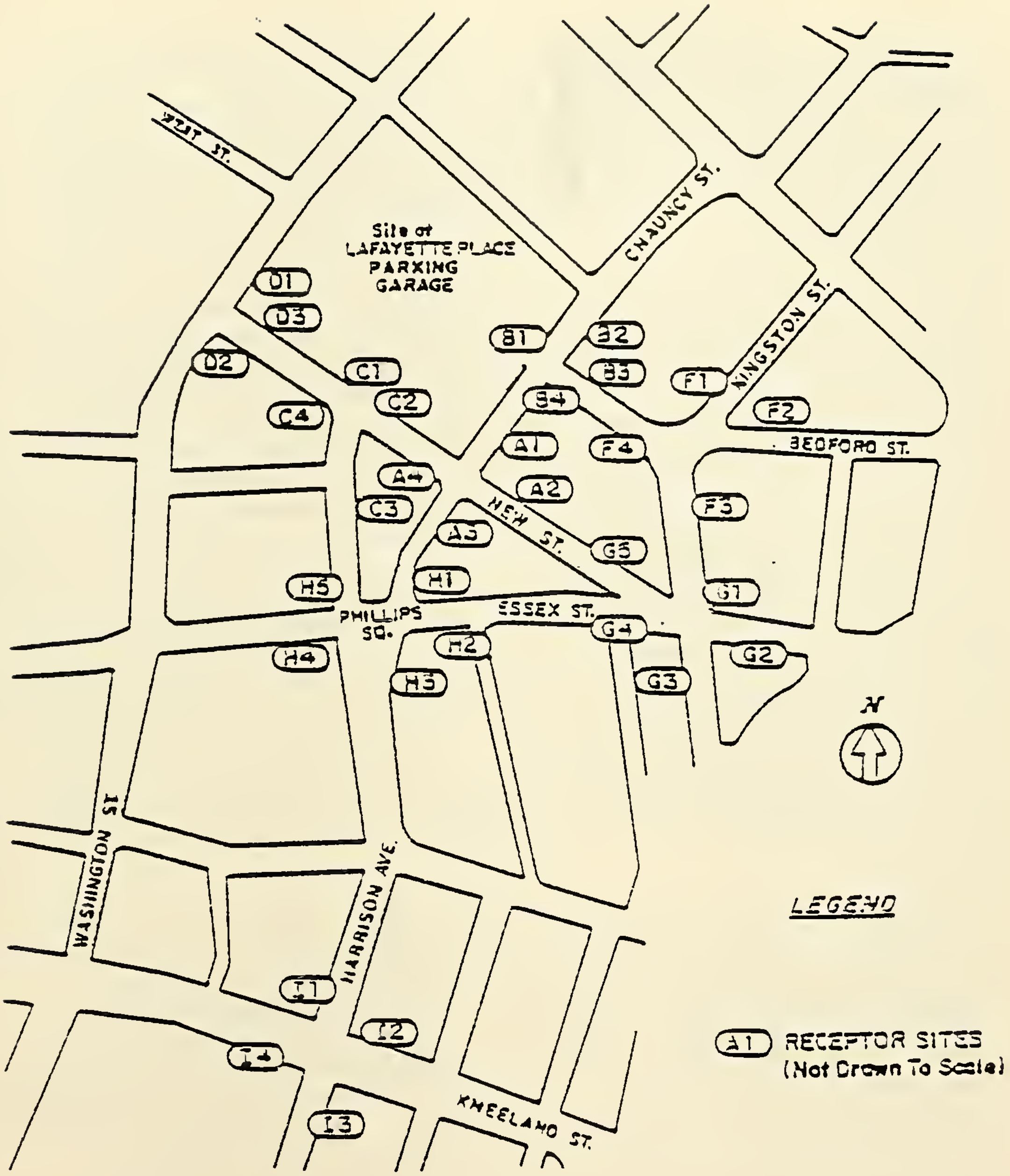
At each intersection, receptor sites were located on the sidewalk of each roadway leading into the intersection. A total of 33 receptors were selected. The sites represented areas of public access and are shown in Figure II.A.35.

Estimates of maximum 1-hour CO concentrations at each receptor location were obtained using the EPA Street Canyon Model. A set of conservative, but physically realizable, modeling conditions were assumed to maximize the emission rates and resulting concentrations. These included:

- a rooftop wind speed of 1 meter per second (m/sec)
- winter conditions with an ambient temperature of 32°F
- an average speed of 15 mph for the uninterrupted flow of the traffic.

---

1. It may be noted here that the traffic counts may tend to be conservative for future conditions around the project area, since existing traffic related to on-site parking lots, which would, in part, be replaced by the garage, were not subtracted from the totals. At the same time, some of this excess would account for project generated traffic which was not related specifically to the garage.



Source: Bolt, Beranek & Newman, Inc., Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage, June 1978, Figure 2

Figure II.A.35: RECEPTOR SITES - LAFAYETTE PLACE AIR QUALITY IMPACT ANALYSIS

In addition, traffic mix data based on BRA traffic surveys was incorporated into the estimate; and a 94% hot transient and 6% cold start mix was used for traffic in the garage. This mix was based on data from the existing parking lots on the project site, which indicated that 94% of the vehicles parked for less than 4 hours. For general traffic in the area, the National Cold/Hot Fraction was used; this mix consists of 21% cold start, 27% hot transients, and 52% stabilized.

Maximum 1-hour and 8-hour CO predictions for the set of receptor locations for the projected year of completion are indicated on Table II.A.20. For all of the intersections analyzed, no exceedance of the 1-hour standard of 35 ppm was found. The CO levels around the garage entrances/exits was estimated to be between 10 and 15 ppm, and the highest 1-hour level was estimated to be 34 ppm for the west approach to the Kneeland and Harrison Streets intersection (where projected demand volume exceeded capacity at this approach). Maximum 1-hour CO level on the approaches to the other intersections generally ranged from 15 to 25 ppm. These high levels were attributable almost entirely to the ideling and acceleration/deceleration emissions from the automobiles on the approach to an intersection. In addition constrained dispersion of the pollutants, as a result of the presence of high building structures on each side of the streets, can contribute to a pollution buildup. Where free flow emissions dominate - for example, at receptors A4 and G5 - the CO levels were often less than 10 ppm. All of the 1-hour estimates included an assumed background level of 5 ppm; this level was arrived at after discussion with personnel of EPA Region I.

The 8-hour results were obtained by direct scaling of the 1-hour predictions and included a background level of 3 ppm, also obtained from direct scaling. Unlike the 1-hour estimates, the 8-hour estimates showed exceedance of the standard of 9 ppm at about one-third of the receptor locations. At the Chauncy and the New Street exits/entrances, the 8-hour levels were 5.5 and 6.8 ppm respectively. The highest 8-hour level, located at the west approach to the Kneeland and Harrison intersection, was 16.2 ppm, which is about 80% over the standard. The highest 8-hour estimate for the remaining five intersections ranged from 10 to 14.2 ppm. The garage's contribution to this potential problem can be estimated on the basis of the percentage of the total traffic volume that is attributable to accessing and egressing from the garage, which ranges from 3% (at the west approch to Kneeland and Harrison) to 47% (at the north approach to Harrison and Essex). (To these concentrations should be added the contributions from the carbon monoxide vented from the garage, which are analyzed below.)

In the above analysis, an important observation concerning ambient CO levels should be noted. It is believed that the estimates of the ambient CO level at the intersections are, in fact, higher than the levels are in actuality. Limited validation of the EPA procedure gave "relative differences (between the observed and the model estimated CO levels) within a factor of two." Unfortunately, the

Table II.A.20

PREDICTED (1982) MAXIMUM 1-HR AND 8-HR CARBON MONOXIDE CONCENTRATIONS AT SELECTED RECEPTOR LOCATIONS

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr†	8-hr**
Chauncy and New Sts.	A1 - North approach on Chauncy St.	42.0	6.9	3.9
	A2 - East approach on New St.	21.6	24.8	12.6
	A3 - South approach on Chauncy St.	46.8	26.5	13.4
	A4 - New St. west from intersection	22.5	9.8	5.3
Chauncy and Bedford Sts.	B1 - By garage exit/entrance	100.0	10.0	5.5
	B2 - North approach on Chauncy St.	14.1	6.4	3.7
	B3 - On Bedford	100.0	5.6	3.3
	B4 - South approach on Chauncy St.	42.0	12.9	6.8
New St. and Harrison Ave.	C1 - By garage exit/entrance	100.0	12.7	6.8
	C2 - East approach on New St.	22.5	15.5	8.1
	C3 - On Harrison, south of intersection	40.2	6.0	3.5
	C4 - On New St. going west	12.9	8.6	4.8

*See Fig. II.A.35

†1-hr standard is 35 ppm.

**8-hr standard is 9 ppm.

Table II.A.20 (cont'd)

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr†	8-hr**
Washington and New Sts.	D1 - On Washington, north of intersection	11.9	8.2	4.5
	D2 - South approach on Washington	0	5.9	3.4
	D3 - East approach on New St.	12.9	25.4	12.9
Bedford and Kingston Sts.	F1 - North approach on Kingston St.	20.2	19.2	10.0
	F2 - On Bedford, going east	100.0	5.4	3.2
	F3 - On Kingston St., going south	20.2	9.2	5.0
	F4 - West approach on Bedford St.	20.2	8.3	4.6
New and Essex Sts.	G1 - North approach on Kingston St.	20.2	24.0	12.1
	G2 - On Essex, going east	0	8.2	4.6
	G3 - On Kingston, going south	0	5.3	3.2
	G4 - West approach on Essex	0	15.2	7.9
	G5 - going west on New St.	21.7	9.5	5.2

*See Fig. II.A.35
†1-hr standard is 35 ppm.
**8-hr standard is 9 ppm.

Table II.A.20 (cont'd)

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr†	Concentrations in ppm 8-hr**
At Phillips Square	H1 - Going north on Chauncy St.	46.8	6.5	3.7
	H2 - Going east on Essex St.	0	8.2	4.6
	H3 - Going south on Harrison Ave.	40.2	6.2	3.6
	H4 - West approach on Essex St.	15.4	22.5	11.5
	H5 - North approach on Harrison St.	40.2	27.8	14.2
Harrison Ave. and Kneeland St.	I1 - North approach on Harrison St.	43.3	15.6	8.1
	I2 - East approach on Kneeland St.	4.7	20.8	13.9
	I3 - Going south on Harrison Ave.	0	23.1	11.7
	I4 - West approach on Kneeland St.	2.6	33.7	16.2

*See Fig. II.A.35
†1-hr standard is 35 ppm.
**8-hr standard is 9 ppm.

Source: Bolt, Beranek & Newman, Inc., Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage, June 1978, Table 2

"canyon" model aspect of this procedure could not be validated. The tendancy to overestimate is especially pronounced when the assumed wind speed drops to 1 min/sec or less. If the model were calibrated with actual observation, the prediction of the highest 8-hour CO level in 1982 would most likely drop to around the 8-hour standard of 9 ppm. Two ameliorating factors also should be taken into account in evaluating these predictions. The first factor is associated with the Federal Motor Vehicle Emission Control Program (FMVECP), which will have a dramatic impact on reducing the exhaust emission rates for all motor vehicles. The impact of the FMVECP on composite (reflecting the mix of motor vehicle age and mileage as used in this study) exhaust emission factors for CO can be found in Appendix C of the BBN Air Quality Impact Analysis (Appendix K). In general, there is a continuing decrease in emission rates with time such that by 1985, the emission rate will be 65% of the 1982 value, and by 1990, this rate will be 40% of the 1982 value. The other ameliorating factor is associated with the proposed Inspection/Maintenance (I/M) Program. The I/M Program is part of the Transportation Control Program and has a high probability of being implemented in the near future. When the I/M Program is in effect, additional emission reductions of about 2% in 1982 and 13% in 1985 (based on a conservative estimate, reflecting the best stringent criteria) will be realized.

Compatibility with the Boston Transportation Control Plan

Since the Lafayette Place and Hayward Place garages are located within the "parking freeze" area, as delineated by the U.S. Environmental Protection Agency's Transportation Control Plan for the Metropolitan Boston Interstate Air Quality Control Region (40 CFR 52.1135), the City of Boston Real Property Department made application to the City of Boston Air Pollution Control Commission for a permit to construct the new garage and rehabilitate the existing garage. On November 15, 1977, the Commission approved the application and issued the Parking Freeze Permit (see Appendix L). In accordance with the requirements of the freeze permit, the City will eliminate an equal number of parking spaces in the immediate vicinity of the project (both on-site and off-site) prior to opening and operation of the two garages. Thus the project will be in conformance with the requirements of the Boston Transportation Control Plan that no new commercial parking spaces be constructed unless an equal number are eliminated.

A VMT (vehicle miles of travelled) analysis relative to the proposed project was also prepared and is included as Appendix M. According to this evaluation, regional VMT is expected to increase by approximately 8.5 million annually over current VMT generated by the project site. This increase is due primarily to the greater attractivness of the proposed project to a clientele that is less dependant on public transportation and which resides in areas where public transportation is not readily available. Compared to the total Metropolitan Boston AQCR VMT, however, the additional VMT would result in an increase of only 0.053%.

Building-Related Air Quality Impacts

The major source of pollutants from the building mechanical systems of the proposed project will be the exhaust air from the ventilation system of the underground parking garage, which will emit primarily carbon monoxide and oxidants into the atmosphere. Since garage exhaust air is commonly emitted at low levels, particular care will be required in the design of the system to avoid the accumulation of the exhaust pollutants in heavily populated portions of the site and to prevent adverse impacts on nearby buildings. This can be accomplished through the careful positioning of intake and exhaust fans, cross-ventilation through garage decks and consideration of the location of entrance and exit ramps. To minimize the impacts, the ventilation system will be designed to modern parking garage ventilating standards to provide acceptable environmental control as well as comply with applicable state and local regulations.

In order to determine the anticipated emissions within the Lafayette Place garage and the associated ventilation requirements, and the potential impact on ambient CO concentrations from the garage emissions, an impact assessment of garage emissions and venting systems also was undertaken by Bolt Beranek and Newman, Inc., and is included in Appendix K.

Emissions from within the garage were based on a peak hour demand, and vehicle running times estimated according to EPA guidelines. The estimated CO emission rate for this peak hour is 10.9 grams per second (g/sec). A number of ventilation requirements were explored to reflect the mix of desirable concentrations within the garage and in the make-up air and are described in Table II.A.21. For the minimum requirement (corresponding to a 100 ppm level in the garage and 5 ppm in the make-up air) a ventilation rate of 209,200 cubic feet per minute (cfm) and a CO discharge rate of 11.3 g/sec were estimated. For the maximum requirement (corresponding to a 35 ppm level in the garage and a 5 ppm in the make-up air), a ventilation rate of 662,400 cfm and a CO discharge rate of 12.5 g/sec were obtained.

The potential impact of the emissions from the garage vents on ambient CO levels at the pedestrian level is manifested in an incremental increase in the "background" CO levels. To estimate this impact, Turner's workbook procedure, which reflects the increased turbulence resulting from the effect of buildings, was followed. The analysis consisted of estimating incremental increases in CO levels at three different locations representing increased distances from the garage.

Both a single vent (located on the roof of the project, adjacent to the new street) and three vents (located on the roof of the project, adjacent to the new, Chauncy, and Washington Streets) were investigated. The results (Table II.A.22) showed that under maximum ventilation conditions with one vent, when emission from the garage is at its highest rate, an increase of 3.2 ppm could be expected for the 1-hour CO level on the adjacent street. This

Table II.A.21: GARAGE VENTILATION PARAMETERS

Ventilation Scenario Identification No.	Description of Ventilation Assumptions	Emission Rate Within Garage (g/sec)	Maximum Concentration in the Garage (ppm)	Concentration in the Make-up Air (ppm)	Ventilation Rate (cfm)	Vented Emission Rate (g/sec)
A	Allowance of 100 ppm in the Garage, 5 ppm in the make-up air, and 209,200 cfm ventilation rate	10.9	100	5	209,200	11.3
B	Same as A, except make-up air is 9 ppm and ventilation rate is 218,400 cfm	10.9	100	9	218,400	11.8
C	Allowance of 50 ppm in the garage, 5 ppm make-up air, and a ventilation rate of 441,600 cfm	10.9	50	5	441,600	11.9
D	Allowance of 35 ppm, 5 ppm make-up air, and a ventilation rate of 662,400 cfm	10.9	35	5	662,400	12.5

Source: Bolt, Beranek & Newman, Inc., Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage, June 1978, Table 3

Table II.A.22

EFFECTS OF GARAGE EMISSIONS ON AMBIENT CARBON MONOXIDE LEVELS IN THE PROJECT AREA

		Impact on CO Levels*			
		1-Vent System†		3-Vent System**	
Ventilation Scenario Ident. No.	Selected Impact Areas	1-hr	8-hr	1-hr	8-hr
A	a) nearest street	2.9	1.7	1.9	1.1
	b) Phillips Sq.	1.8	1.1	1.4	0.8
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
B	a) nearest street	3.0	1.8	2.0	1.2
	b) Phillips Sq.	1.9	1.1	1.5	0.9
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
C	a) nearest street	3.1	1.9	2.0	1.2
	b) Phillips Sq.	1.9	1.1	1.5	0.9
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
D	a) nearest street	3.2	1.9	2.1	1.3
	b) Phillips Sq.	2.0	1.2	1.6	1.0
	c) Kneeland & Harrison	1.1	0.7	1.1	0.7

*CO levels are given in parts per million (ppm).

†When 1 vent is used, the vent is located on the roof of the facility adjacent to New St.

**When 3 vents are used, they are located on the roof of the facility adjacent to New, Chauncy, and Washington Sts.

Source: Bolt, Beranek & Newman, Inc., Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage, June 1978, Table 4

contribution is reduced to 2.1 ppm if a three vent system is used. For receptors that are farther away, for example, at the intersection of Kneeland and Harrison Streets, this contribution to the 1-hour CO level drops to 1.1 ppm. At this distance, the difference between a 1-vent and a 3-vent system is barely noticeable. The maximum contribution to the 8-hour CO level on the adjacent street from a 1-vent system is estimated at 1.9 ppm. This contribution can be lowered to 1.3 ppm with a 3-vent system.

Minor sources of building-generated pollutants will include exhaust ventilation for the air conditioning systems, cooling towers, kitchen ventilation exhausts and individual machinery exhausts (e.g., dryers). Except for gas cooler flues (if gas is used for this purpose), none of these sources emit particulates, as no buring or firing process is involved. The emissions are water vapor or air (generally warm), which could contain minimal amounts of other pollutants. They are planned to be vented high enough to avoid any contact with populated areas. The elimination of noxious fumes and substances from the exhausts are covered by the Building Code (e.g., grease traps in kitchen exhaust). Moreover, the State Building Code also specifies constraints for the location of these exhausts so as to minimize their nuisance potential (Section 1811).

7. Noise Levels

a. Noise Measurement

The noise environment of a typical urban area is generally defined by an ambient, or steady "background" noise, which is the sum of many different noise sources upon which is superimposed the noise of individual local sources, such as passing vehicles or occasional aircraft flyovers.

Noise levels are commonly measured in an A-weighted decibel scale, or dB(A), which simulates the human perception of noise, particularly its annoying aspects. Since the dB(A) scale is logarithmic, changes in dB(A) levels do not follow simple arithmetic relationships. Thus, if the sound intensity in any area is doubled, there will be an increase of only 3 dB(A), which is barely detectable. To the human ear, however, sound will appear twice as loud with an increase of approximately 10 dB(A). Noise levels associated with common sources of noise are indicated on Figure II.A.36.

In assessing potential noise impact, both the time fluctuations of the noise level and the maximum noise levels are important. Noise fluctuations may be described by determining those levels exceeded a certain percentage of time. Hence, for a specific time period, the L_{90} level describes the noise level exceeded 90% of the time and is generally considered as "background" noise. The L_{10} level (or the level exceed 10% of the time) is normally indicative of higher noise levels occurring during the time period and, in the case of urban communities, indicates the character of localized traffic noise sources. The L_{50} level represents the median noise level.

In addition to absolute noise levels, an increase in the existing ambient will be perceived as an intrusion or impact by people who customarily use an affected area. Changes in noise levels create an impact which is roughly proportional to the increase. Emperical studies have shown that, in an urban environment, people can begin to distinguish changes in noise levels of approximately 5 dB(A). Lesser changes are generally considered insignificant and imperceptable. For changes above 5 dB(A), it is commonly accepted that increases of 5-15 dB produce "some impact" while noise level increases of more than 15 dB are usually considered severe (Figure II.A.37). Estimates of the magnitude of noise effects are indicated on Table II.A.23.

Noise Level Criteria

In order to assess noise impact, standards relating to community noise impact have been established by some governmental agencies. The Federal Highway Administration (FHWA) has adopted standards which are promulgated in their "Policy and Procedure Memorandum 90-2, Noise Standards and Procedures" (February 8, 1973). FHWA

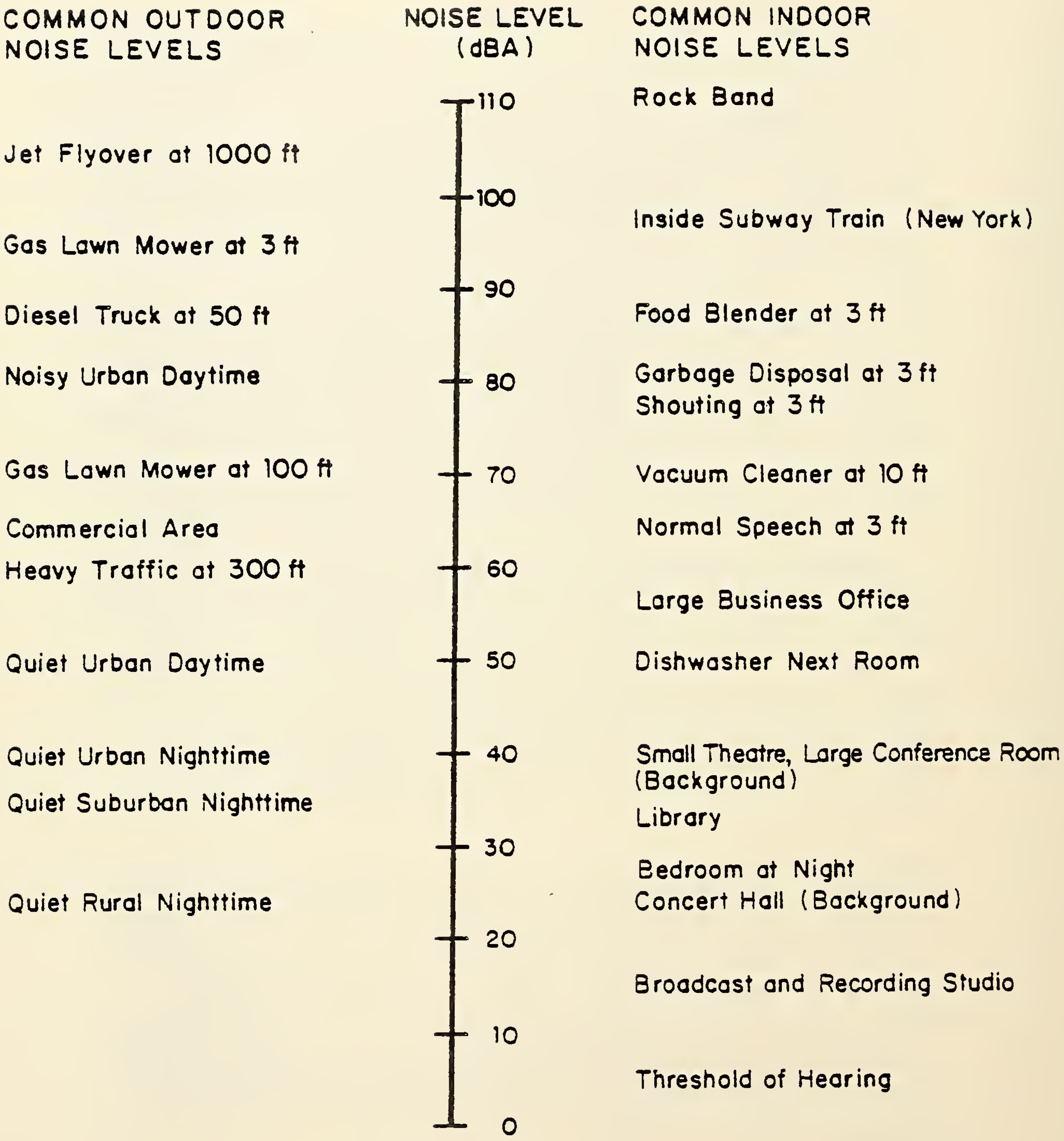


Figure II.A.36
COMMON INDOOR AND OUTDOOR NOISE LEVELS.

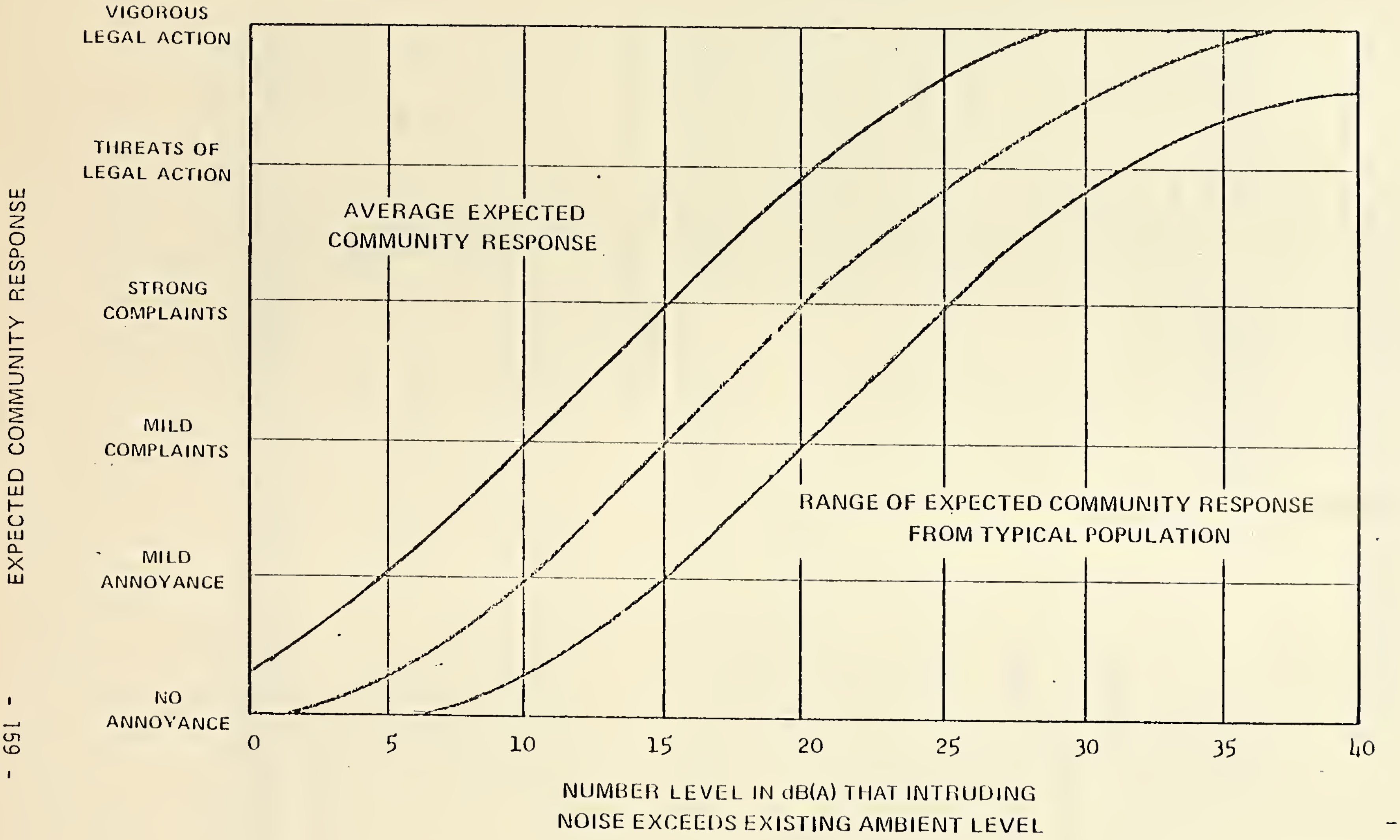


Figure II.A.37

EXPECTED COMMUNITY RESPONSE
VERSUS
dB(A) LEVEL INCREASE
OVER EXISTING AMBIENT

TABLE II.A.23

ESTIMATES OF MAGNITUDES OF NOISE EFFECTS[1]
(in dB(A))

Effect	Moderate Level of Effect	Appreciable Level of Effect
Hearing Damage Risk[a]	70	90
Speech Interference[b]	45	60
Sleep Interference[b]	40	70
Physiological Stress[b]	*	90
Startle[b]	*	110
Annoyance[b]	50	60
Task Interference[b]	55	75

Notes:
a 8-hour daily exposure
b any exposure

---

[1] Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, NTID 300.1, December 31, 1971, (EPA)

criteria specify various design noise level limits for highway noise during the noisiest traffic hours in areas occupied or used by people. For commercial areas, the exterior L_{10} design noise level is 75 dB(A), and for hotels, 70 dB(A).

The U.S. Department of Housing and Urban Development (HUD) has also established noise policy and criteria, published in HUD Circular 1390.2, to determine the acceptability of acoustic environments for Federally-assisted housing developments. Standards are expressed in terms of maximum allowable exterior and interior noise levels not to be exceeded for specific time durations in a 24-hour period and an 8-hour (11 p.m. - 7 a.m.) normal sleeping period. For exterior noise, HUD's limiting criteria is that noise levels shall not exceed 65 dB(A) for more than 8 hours per 24 hour period.

The City of Boston Air Pollution Control Commission has promulgated, pursuant to Chapter 40, Section 21, of the Massachusetts General Laws and Title 7, Section 50, of the City of Boston Code, regulations for the control of noise within the City. These regulations prohibit noise emissions at such levels as to cause a condition of noise pollution and restrict, among other things, noise emissions according to zoning district and from construction sites. For business districts, the maximum allowable noise level measured at the lot line of a business use is 65 dB(A) at any time. Noise from construction activites in a business district is not to exceed 80 dB(A), measured at 50 feet from the nearest active construction device on the site.

Finally, the Commonweatlh of Massachusetts has a noise standard that basically consists of a prohibition of pure tone noise generation and of increases in ambient noise levels in excess of 10 dB(A).

b. Description of Existing Conditions

Ambient noise levels at the Lafayette Place project site and environs are those typical of a dense urban environment and consist primarily of street noises from downtown vehicular traffic and pedestrian circulation. There are few medium or heavy truck movements (a recent 11 a.m.-6 p.m. traffic count on Washington Street indicated such trucks comprised only 2.4% to 3.6% of the traffic flow), but some streets, including Chauncy Street, do have considerable bus traffic. A downtown noise measurement program completed by the City of Boston Air Pollution Control Commission in the summer of 1975 indicated an average midday L_{10} level of from 68 to 78 dB(A) and a L_{eq} level of 65.9 to 77.7 dB(A) in the core area (see Appendix N). Noise levels are considerably reduced at night, when the business district is unoccupied except for passing traffic and occasional pedestrians. Based on EPA criteria, these levels are not abnormally high and, in fact, are somewhat less than might be expected for a downtown area.

The project site is not within a flight path of Logan International Airport and is located outside the NEF 30 contour;[1] future projections of aircraft flight patterns indicate that the project would remain outside the NEF 30 contour. Although the heavily travelled Central Artery is three blocks distant (approximately 800 feet), it is in a tunnel section at this location and therefore has no noise impact on the project area.

In order to determine the current ambient noise environment at the Lafayette Place site, measurement samples of noise levels were made at three locations (see Figure II.A.38) in and near the project area on March 20-22, 1978. Measurement locations were selected on the basis of proximity to project noise source locations and critical receptor locations; times were chosen to measure midday conditions (when pedestrian volumes are the heaviest) and rush-hour conditions. Measurements were taken on the dB(A) scale, every 10 seconds for 1-hour periods, using a Bruel & Kjaer Type 2205 Sound Level Meter. Data obtained from each site were analyzed by using an EPA computer program available at the Region I office. In addition, traffic classification counts were taken at the same time as the noise measurements. The results of the survey are shown on Table II.A.24 below and Figure II.A.38; measurement and classification data are included in Appendix O.

Table II.A.24

Lafayette Place Ambient Noise Measurement Survey

(1) Midday Noise Levels - 11 a.m. - 12 noon

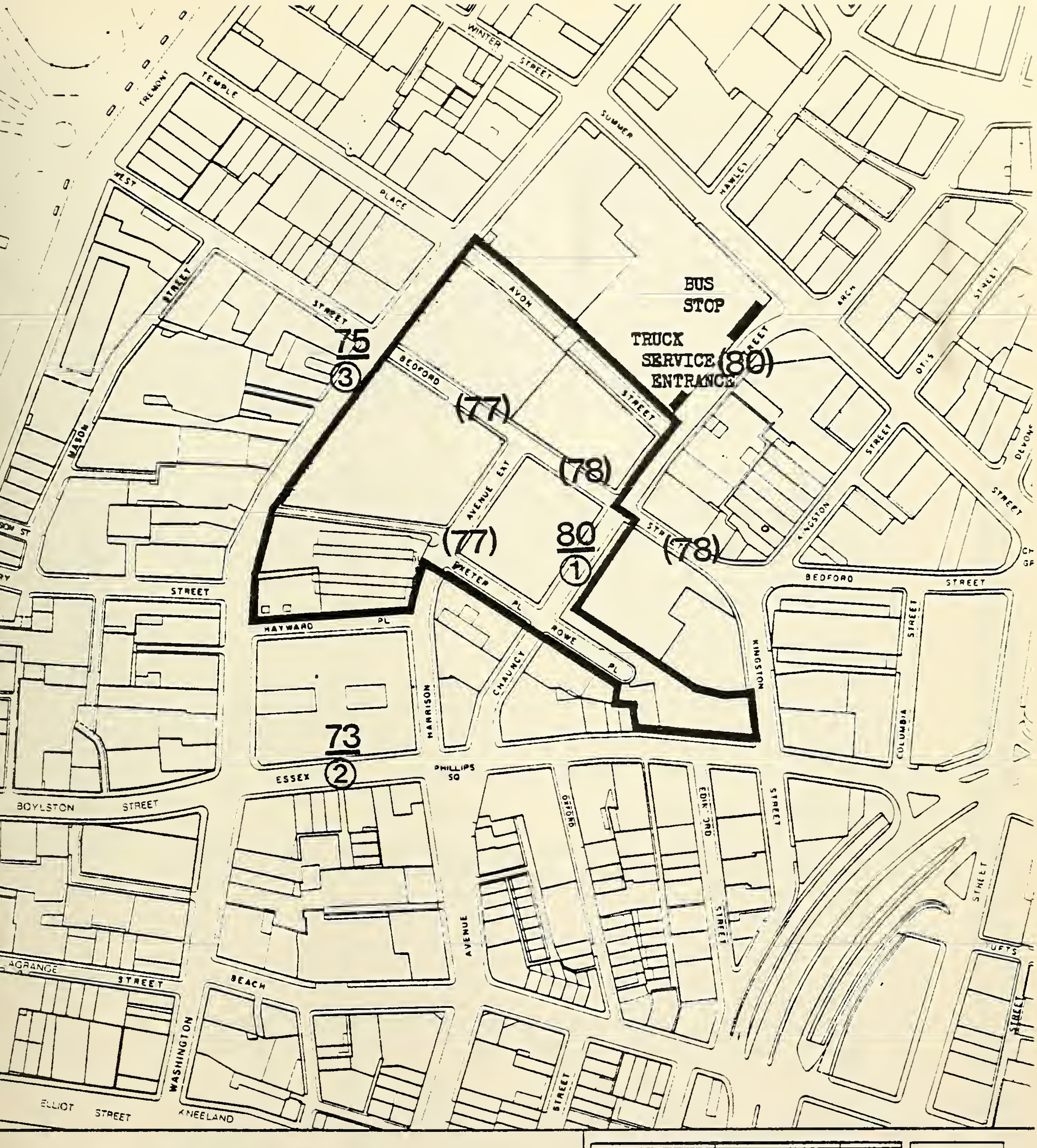
Date	Site No.	Location	dB(A) L_{10}	L_{50}	L_{90}	L_{eq}
03/20/78	1	Chauncy St., between Bedford St. and Essex St.	76	66	59	77
03/21/78	2	Essex St., between Washington St. and Harrison Ave. Ext.	78	69	64	75
03/22/78	3	Washington St. at Bedford St.	77	70	66	74

(2) Peak Hour Noise Levels - 4:30 p.m. - 5:30 p.m.

Date	Site No.	Location	dB(A) L_{10}	L_{50}	L_{90}	L_{eq}
03/20/78	1	Chauncy St. between Bedford St. and Essex St.	81	70	62	80
03/21/78	2	Essex St. between Washington St. and Harrison Ave. Ext.	75	69	66	73
03/22/78	3	Washington St. at Bedford St.	77	70	67	75

---

[1] Bolt Beranek and Newman, Inc., "Boston-Logan International Airport Aircraft Noise Exposure" (map), prepared for Massachusetts Port Authority, October 12, 1977.



① NOISE MONITORING AND TRAFFIC CLASSIFICATION COUNT SITE

75 MEASURED L_{eq} NOISE LEVEL, dB(A)

(78) ESTIMATED L_{eq} NOISE LEVEL, dB(A)

0 200 400 FEET

LAFAYETTE PLACE

AMBIENT NOISE LEVEL
MONITORING PROGRAM

(P.M. PEAK HOUR=4:30-5:30)
Figure II.A.38
BOSTON REDEVELOPMENT AUTHORITY

As this table indicates, the project site can be characterized as a relatively high noise level area that is typical of urban centers. The observed L_{10} levels vary between 76 dB(A) and 81 dB(A), which exceed the 80/75 dB(A) highway noise guidelines suggested by FHWA PPM 90-2 for hotel and commercial land uses. The measurements also show that the 80 dB(A) level is not exceeded for more than 12 hours during the typical business day. Background (L_{90}) levels vary between 59-62 dB(A) on Chauncy Street and 66-67 dB(A) on Washington Street, showing the influence of heavier traffic volumes on the latter street. It can also be noted that the L_{eq} levels, which range from 73 to 90 dB(A), exceed the L_{eq} of 70 dB(A) over a 24 hour period which EPA has determined is requisite to protect public health and safety with an adequate margin of safety.[1]

Analysis of the noise data with the traffic classification counts indicates that the high L_{eq} levels are due primarily to bus and truck traffic, particularly on Chauncy Street, which is a major bus route during peak hour. Traffic counts during the 4:30-5:30 p.m. peak hour indicated that bus and truck traffic was 20% of the total traffic flow and that one of these vehicles used this street on an average of every 54 seconds.

c. Impact of the Proposed Project

The noise level impacts of the Lafayette Place development will fall into three areas of concern -- noise generated during the construction process, noise from the mechanical equipment installed in the completed project, and noise from the increased vehicular traffic generated by the retail/hotel complex.

Construction Activities

The peak noise levels associated with the Lafayette Place project will take place during the preparation of the site and the construction of the proposed garage, retail center and hotel. These impacts will be short-term in time and although spread out over the estimated four-year construction period, they will be concentrated during the first half of this period. While construction equipment schedules have not as yet been developed for this project, the experience of other recently completed construction projects in the area, as well as available data, can be employed to estimate the noise levels and impacts expected to be associated with the project's construction work.

The ambient noise environment of the project environs will be affected by a noticeable increase in noise levels during the working hours from the various pieces of construction equipment and trucks, which produce fairly high levels of noise. Typical noise levels from various types of construction equipment are indicated on Table II.A.25 and Figure II.A.39 and range from 69 to 98 dB(A).

---

[1] U.S. Environmental Progection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. (Report No. 550/9-74-004), Washington, D.C. March, 1974.

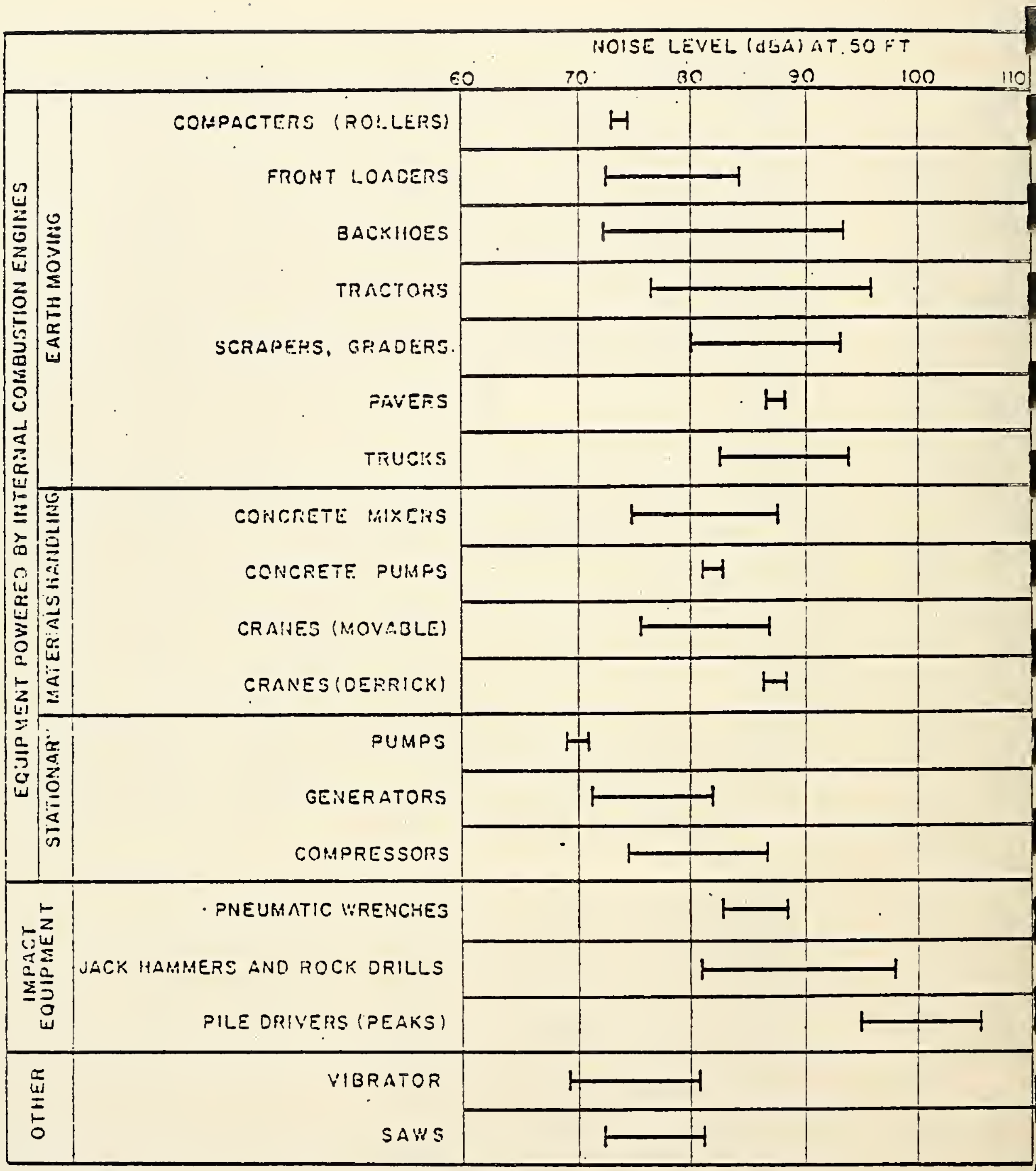
Table II.A.25: NOISIEST EQUIPMENT TYPES OPERATING AT CONSTRUCTION SITES*[1]

Construction Phase	Construction Type			
	Domestic Housing	Office Bldgs.	Industrial	Public Works
Ground Clearing	Truck (91)	Truck (91)	Truck (91)	Truck (91)
	Scraper (88)	Scraper (88)	Scraper (88)	Scraper (88)
Excavation	Rock Drill (98)	Rock Drill (98)	Rock Drill (98)	Rock Drill (98)
	Truck (91)	Truck (91)	Truck (91)	Truck (91)
Foundations	Concrete Mixer (85)	Jack Hammer (88)	Jack Hammer (88)	Truck (91)
	Pneumatic Tools (85)	Concrete Mixer (85)	Concrete Mixer (85)	Scraper (88)
Erection	Concrete Mixer (85)	Derrick Crane (88)	Derrick Crane (88)	Paver (89)
	Pneumatic Tools (85)	Jack Hammer (88)	Jack Hammer (88)	Scraper (88)
Finishing	Rock Drill (98)	Rock Drill (98)	Rock Drill (98)	Truck (91)
	Truck (91)	Truck (91)	Truck (91)	Paver (89)

---

*Numbers in parentheses represent typical dB(A) levels at 50 ft. See Table I for definition of construction types.

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.



Note: Based on Limited Available Data Samples

Figure II.A.39: CONSTRUCTION EQUIPMENT NOISE RANGES.[1]

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

The single noisiest piece of equipment is the pile driver, with peaks of 105 dB(A). Other loud equipment includes diesel trucks, tractors, and pavement breakers. Although pile driving equipment and jack hammers are extremely noisy, they are generally prevalent only during the excavation and foundation phases, whereas trucks, while somewhat less noisy, are present throughout the construction period. It should also be noted that the construction noise impacts would be mitigated to some extent by relatively high ambient noise levels found in the downtown area and by the fact that the percentage of time the loudest devices are operating at the noisiest mode in the most used phase on-site is extremely minimal, ranging from .04% (for pile drivers) to .4% (see Table II.A.26). As a result, construction noises generated by the project would have a lesser impact on the project environs than in a quieter environment.

It is anticipated that the construction noise impacts would occur only during the normal daytime working hours (7-8 a.m. to 3:30-4:30 p.m.). However, for the downtown area where the project is located, this represents the time period in which the greatest concentration of people are present for shopping, business, visiting, or other activites. Construction noise will be a disturbing intrusion for the pedestrians, but it is an unavoidable impact (which nonetheless can be mitigated -- see Part IV) and will be felt for a limited period of time only. Current knowledge on the perception and acceptability of community noise is given in Figure II.A.40.

Noise levels experienced during the construction of the Lafayette Place complex will vary greatly during any one day and over the entire construction period depending on the phase of construction, the type of equipment being used, the number and duty cycle of each piece of equipment, the location of the equipment and the average noise level. Maximum noise levels would exist if all equipment were operating simultaneously. In reality, all equipment is not expected to be operating at one time, or near one point, and some pieces may be below grade and thus shielded. In addition, since sound relationships are logarithmic, two or more machines producing the same noise energy would only add 3 dB(A) each; and, if one noise source is much louder than the other, the lower one will not be heard or measured in the overall sound level. Moreover, continuous or semi-continuous operation of construction equipment allows individual noise sources to blend in with other on-going construction activities. Pile drivers, however, because of their intermittent generation of noise, are a more prominent noise source and therefore more susceptable to disruption and annoyance.

Because the existing buildings on the site are expected to be dismantled by hand methods and cranes rather than demolished with a steel ball, for safety reasons, noise levels during demolition are not expected to increase appreciably, although temporary higher increases occasionally may be experienced. A steel ball or jackhammer may be used to break up the basement floors of these buildings. During this operation, noise levels will be unavoidably higher than during the majority of the demolition period.

Table II.A.26: USAGE FACTORS OF EQUIPMENT IN NONRESIDENTIAL CONSTRUCTION# [1]

Equipment†		Construction Phase				
		Clearing	Excavation	Foundation	Erection	Finishing
Air Compressor	[81]		1.0(2)	1.0(2)	1.0(2)	.4(2)
Backhoe	[85]	.04	.16			.04
Concrete Mixer	[85]			.4	.4	.16
Concrete Pump	[82]			.4	.08	.08
Concrete Vibrator	[76]			.4	.1	.04
Crane, Derrick	[88]				.16	.04
Crane, Mobile	[83]				.16(2)	.04(2)
Dozer	[80]	.16	.4			.16
Generator	[78]	.4(2)	1.0(2)			
Grader	[85]	.08				.02
Jack Hammer	[88]		.1	.04	.04	.04
Loader	[79]	.16	.4			.16
Paver	[89]					.1
Pile Driver	[101]			.04		
Pneumatic Tool	[85]			.04	.16(2)	.04(2)
Pump	[76]		1.0(2)	1.0(2)	.4	
Rock Drill	[98]		.04			.005
Roller	[74]					
Saw	[78]			.04(3)	1.0(3)	
Scraper	[88]	.55				
Shovel	[82]		.4			
Truck	[91]	.16(2)	.4			.16

Numbers in parentheses represent average number of items in use, if that number is greater than one. Blanks indicate zero or very rare usage.

† Numbers in brackets [ ] represent average noise levels [db(A)] at 50 ft.

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

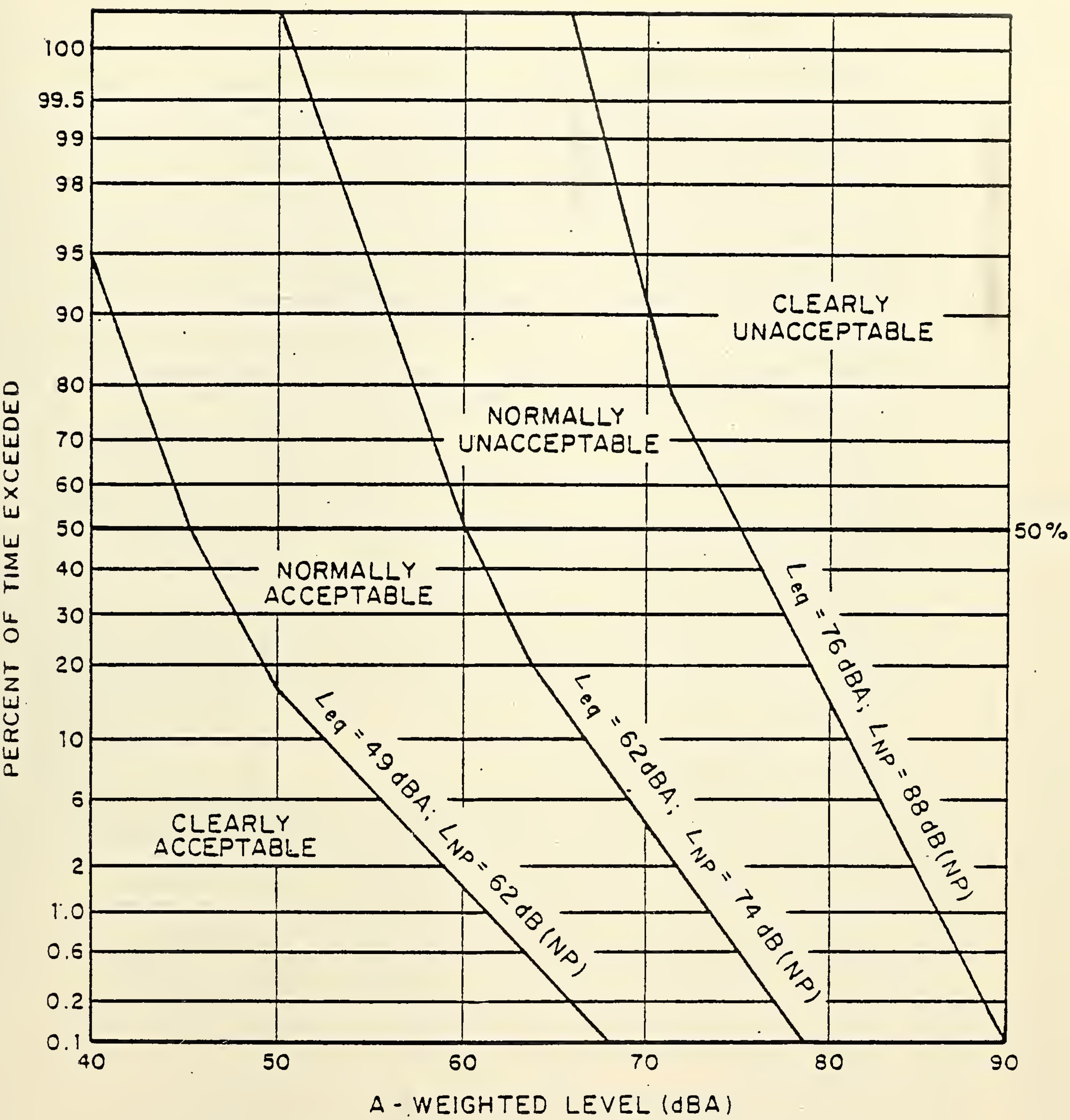


Figure II.A.40: PROVISIONAL CRITERIA RELATING NPL TO COMMUNITY NOISE ACCEPTABILITY[1]

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

With the exception of pile driving operations, the excavation phase is considered to represent the high point in daily construction noise generations. This is the phase that is expected to use the greatest daily volume of trucks (estimated at 67 trucks per day). This phase also requires other major noise generating equipment, such as backhoes and front-end loaders. A conservative estimate of the noise levels associated with this period, based upon a mix of construction equipment, would result in maximum external noise levels of approximately 90 dB(A) at a distance of 100 feet from the assumed center of equipment operation (see Table II.A.27).

Existing soil conditions will most likely require the use of pile driving equipment in this project, at least for the hotel tower. Pile driving represents the noisiest construction operation, with a noise emission level (at 50 feet) of over 100 dB(A). The number and physical distribution of the piles is not yet known: Assuming piles will be required only for the hotel portion of the project, the closest to Washington Street that pile driving would occur would be 300 feet. With impulse noise levels of over 90 dB(A), pedestrians on Washington Street clearly would be affected. However, the maximum daily exposure of the shopping public to the pile driving is expected to be relatively brief, on the order of less than 30 minutes. Nevertheless, quiet pile drivers are available and can be used, although their use tends to increase construction costs and time. With a muffler on the exhaust and sound barrier on the leads, it is possible to reduce the noise level to as much as 85 dB(A) at 25 feet.

Building Mechanical Equipment

Building mechanical systems, located in and on buildings, can and do introduce noises that will impact the surrounding environment. Unlike some traffic noise sources, these systems radiate noise in the same place, at a relatively continuous level. Such potential noise sources could include intake and exhaust louvres, discharge stacks, air conditioners, cooling towers and similar equipment. In several of these, the actual noise generated is somewhat removed from the "noise location", such as a fan placed behind a louvre. Typical sound level ranges and exposure for various types of building equipment systems are indicated in Figures II.A.41/42 and Table II.A.28.

Since detailed building designs are not available, the actual degree of noise impact from building equipment cannot be estimated at the present time. The extent of the environmental noise at any receptor location would, of course, be a function of the HVAC capacity, acoustical design aspects, and location.

If any of this equipment is located near the sidewalk level, the noise contribution to pedestrians could be as high as 70 dB(A). Because the project is located in an area of high background noises (varying as high as 67 dB(A) during weekday business hours), the net measurable increase in noise levels at these times would be small. During non-working hours and Sundays, how-

Table II.A.27: TYPICAL RANGES OF NOISE LEVELS AT CONSTRUCTION SITES WITH A 70 dB(A) AMBIENT TYPICAL OF URBAN AREAS[1]

	Domestic Housing		Office Building, Hotel, Hospital School, Public Works		Industrial, Parking Garage, Religious, Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches		
	I	II	I	II	I	II	I	II	
Ground Clearing	84 6 100	83 8 103	84 6 99	84 8 103	84 6 101	87 8 103	84 6 100	84 7 101	Energy Average dB(A) Standard Deviation NPL
Excavation	88 7 106	76 5 88	89 6 104	79 2 85	89 7 106	74 1 77	89 6 105	79 2 85	Energy Average dB(A) Standard Deviation NPL
Foundations	81 7 99	81 7 100	78 3 85	78 2 85	78 3 85	78 3 85	88 8 108	88 8 108	Energy Average dB(A) Standard Deviation NPL
Erection	82 6 97	71 1 75	85 5 97	76 1 79	85 7 103	74 2 80	79 3 88	79 4 88	Energy Average dB(A) Standard Deviation NPL
Finishing	88 7 106	74 4 84	89 6 104	76 4 86	89 6 104	75 3 84	84 6 100	84 6 100	Energy Average dB(A) Standard Deviation NPL

I - All pertinent equipment present at site.

II - Minimum required equipment present at site.

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

Table II.A.28: EXPOSURE OF BUILDING OCCUPANTS TO THE NOISE OF BUILDING EQUIPMENT[1]

Building Equipment	Location	Type of Exposure		
		Direct	Indirect	
			Through Mechanical Distribution System	Through Walls, Floors, etc.
Air Conditioning	MER*		x	x
	Roof. Unit		x	x
	Wind. Unit	x		
Absorption Machines	MER			x
Air Compressor	MER			x
Ballasts	Room	x		
Boilers	MER			x
Boiler Feed System	MER			x
Chillers	MER			x
Condensers	Rooftop			x
Cooling Towers	Rooftop			x
Dehumidifiers	MER		x	x
Diesel Eng.	MER			x
Diffusers	Room	x		
Electric Motors	MER			x
Elevators	Varies	x	x	x
Escalators	Varies	x	x	x
Fans	MER		x	x
	Room	x		
Furnaces	MER			x
Gas Turbines	MER			x
Heat Pumps	MER			x
Humidifiers	MER		x	x
Mixing Boxes and Air Control Units	Varies	x	x	
Pneumatic Transporter System	Varies		x	x
Pumps	MER			x
Steam Valves	MER			x
Transformers	MER			x
Unit Vent and Unit Heat	Room	x		

*Mechanical Equipment Room

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

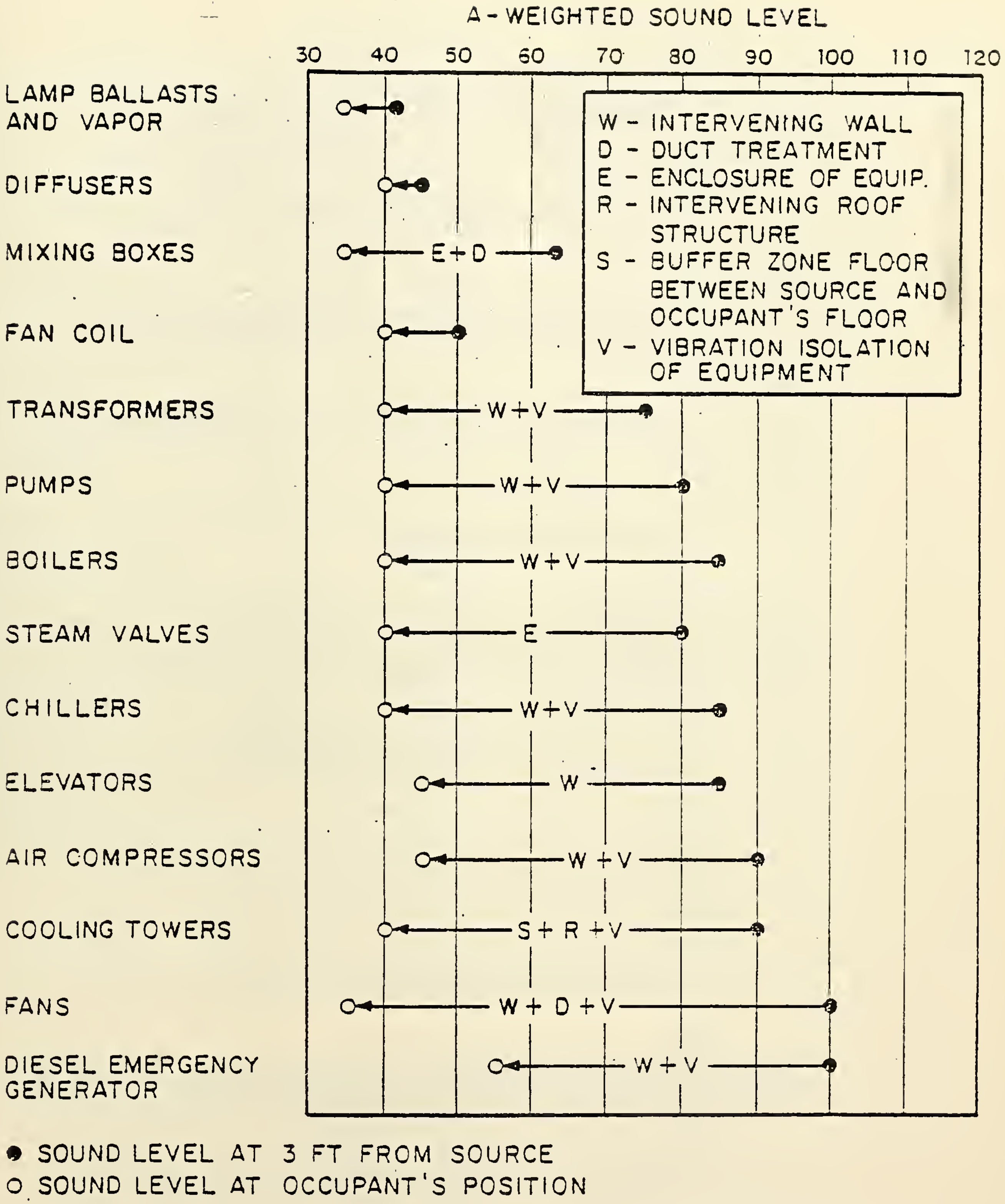


Figure II.A.41: RANGE OF BUILDING EQUIPMENT NOISE LEVELS TO WHICH PEOPLE ARE EXPOSED.[1]

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

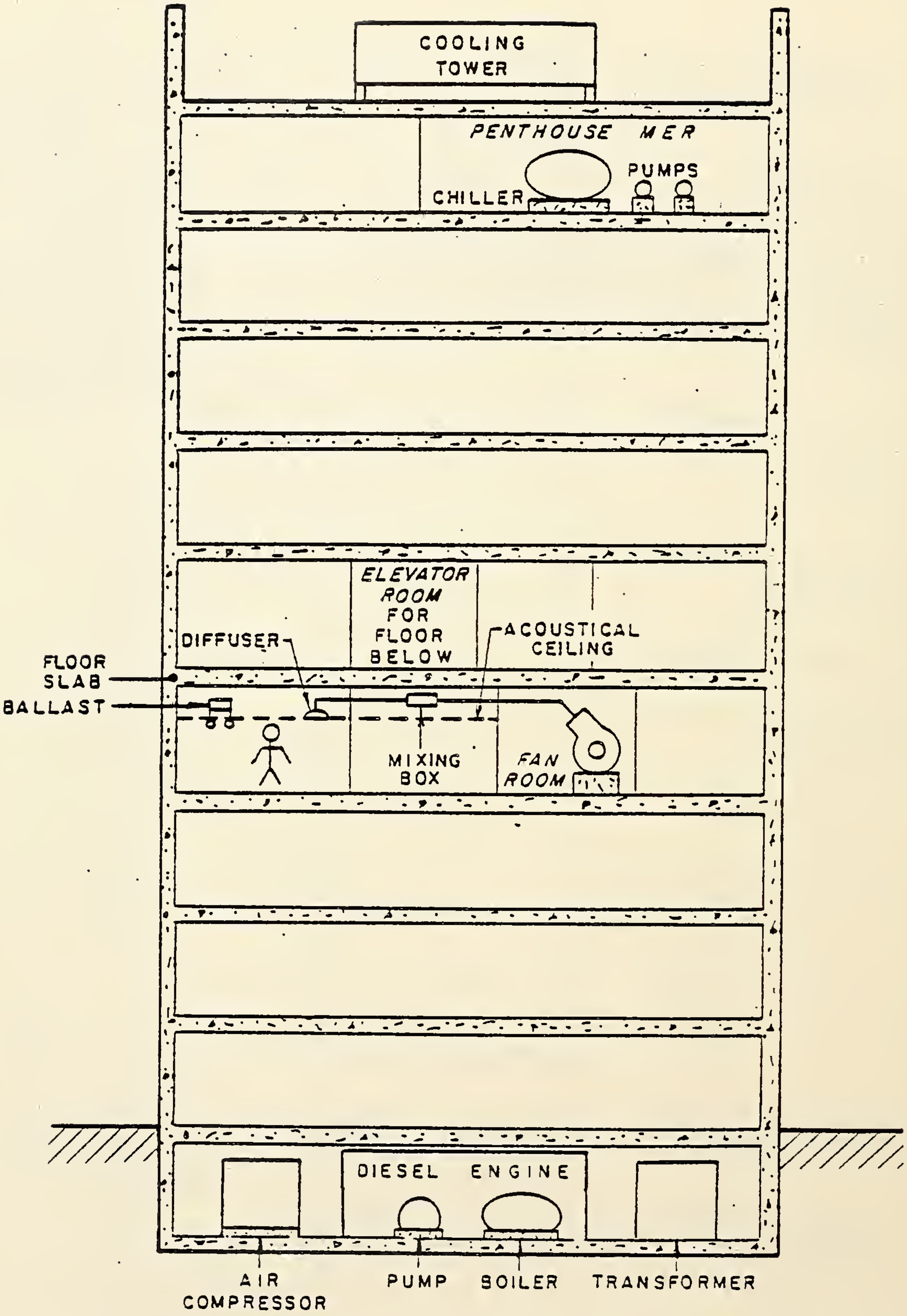


Figure II.A.42: CROSS-SECTION OF A TYPICAL MULTISTORY BUILDING SHOWING BUILDING EQUIPMENT.[1]

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971

ever, when the background could be reduced to levels as low as 55-60 dB(A), HVAC noise would be the governing contribution and would have a disrupting impact. Under these circumstances, the noise standards of both the City (with maximum levels of 55 dB(A) in business zones) and Massachusetts (no change greater than 10 dB(A) at the property lines or nearest inhabited building) would be violated.

On the other hand, building equipment noise can be regulated by design controls and mechanical controls to ensure that levels will not adversely affect ambient conditions. Where possible, the location of the equipment at the highest point of the project could serve to reduce the noise impact by normal decay with distance of sound pressure levels, molecular absorption, and the simple geometric spreading of the energy from a point-like source. The project's developer will be committed to design the HVAC system to meet or exceed applicable noise level regulations. It is expected, therefore, that noise levels from such equipment will be as low as currently available technology and construction practices allow.

Traffic Noise

Traffic volumes generated by the Lafayette Place garage and the retail/hotel complex are not expected to result in any significant increase in ambient noise levels. In making this evaluation, it must be recognized that prior to the construction of the Lafayette Place project, noise levels abutting the development site will be altered by the implementation of the TTIP proposals, described in Section A.4, which will necessitate adjustments in downtown traffic circulation patterns, with consequent changes in traffic volumes on adjacent streets. Under TTIP, traffic volumes will be significantly reduced on portions of Washington and Chauncy Streets and will be considerably increased on Bedford Street (which traffic will be transferred to the new east-west arterial when Bedford Street is closed by the Lafayette Place project). In addition, heavy bus volumes (estimated at 30-35 buses during the p.m. peak hour) will be added to the automobile traffic on some of these streets. Consequently, noise levels on streets with greater traffic volumes or added bus volumes can be expected to increase to a certain degree.

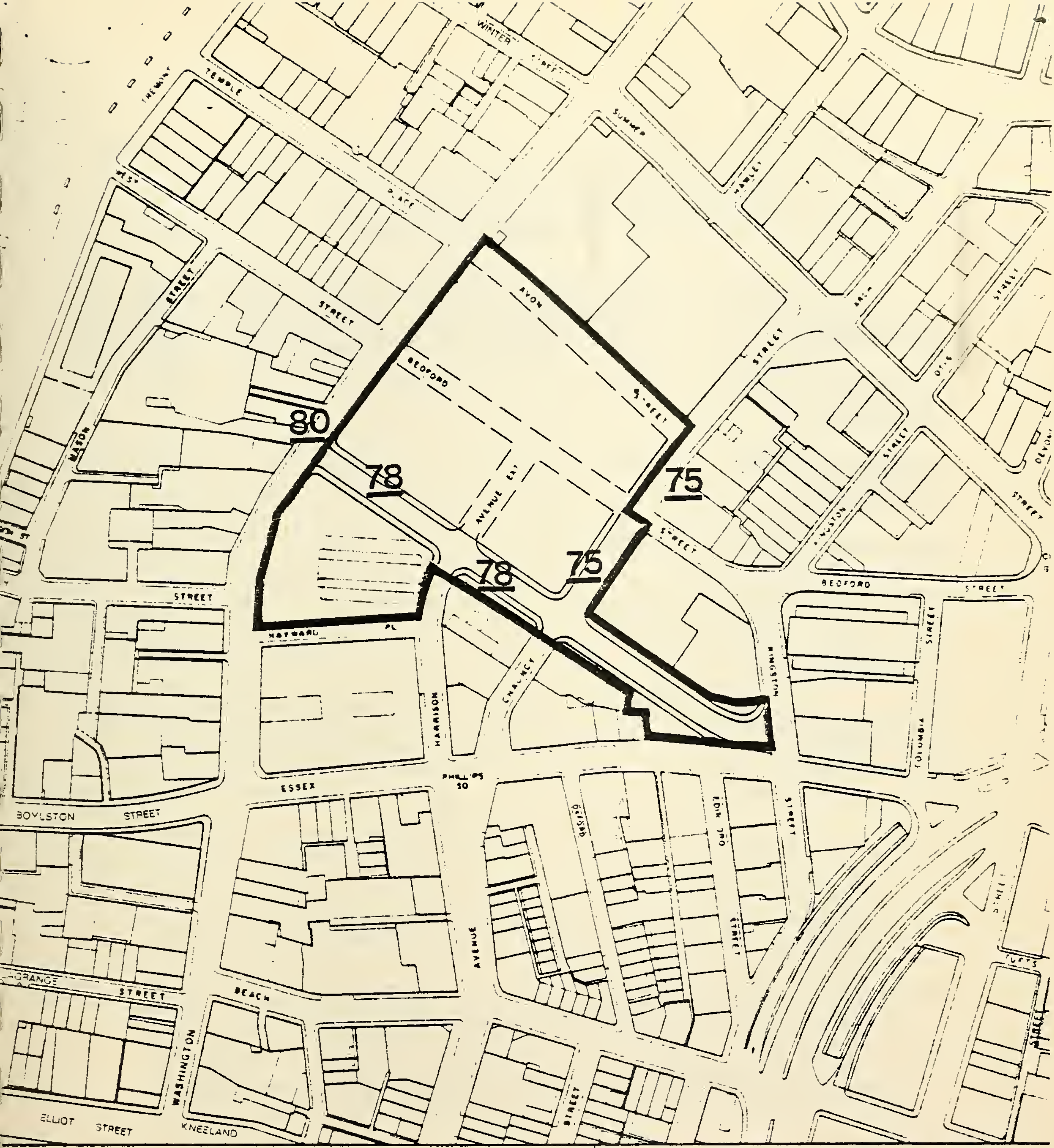
Based on an analysis of existing noise measurements taken at the project site and at other similar locations in the downtown area, and by making appropriate adjustments for bus and truck traffic,[1] it is projected that the addition of 30-35 buses in the hourly traffic stream of Washington Street would raise L_{eq} levels by approximately 5 dB(A) while traffic volume changes on Chauncy Street would reduce L_{eq} levels by 5 dB(A). A 5 dB change would begin to be perceptible by most people but would not be expected to cause any annoyance, or only very minor annoyance to some people. At the same time, this analysis also indicated that the anticipated increases in automobile traffic on certain of the streets would have minimal effect on overall noise levels.

---

[1] For basis of this analysis, see Appendix P.

Since the traffic volumes to be generated by the Lafayette Place project, being spread out over the day rather than concentrated during peak hours, generally would produce relatively minimal increases in the traffic flow on the surrounding street segments, it can be reasonably concluded that proposed development project would not cause any adverse impacts on the ambient noise environment and would not violate any applicable standards. (Maximum increases which would be expected from garage generated traffic during the P.M. peak hour range from 46.5% on Summer Street, between Purchase and South Streets, to 126% on Kingston Street, from Summer Street to Essex Street. Increases on the remaining street segments are less than 30% and, for the most part, are not significant (see Figure II.A.43).) The increases which are anticipated in the future will be due almost entirely to changes brought about by traffic adjustments of the TTIP plan and especially by the addition of buses on certain streets. In any case, the magnitude of the noise level changes is, as noted above, minor.

Projected noise levels following implementation of the TTIP plan and the Lafayette Place project are indicated in Table II.A.29 below. Projected L_{eq} levels for the streets surrounding the project area range from 75 dB(A) for Chauncy Street to 78 dB(A) for the new east-west arterial to 80 dB(A) for Washington Street.



75 PROJECTED L_{eq} NOISE LEVELS, dB(A)
(P.M. PEAK HOUR = 4:30 - 5:30)

LAFAYETTE PLACE

PROJECTED NOISE LEVELS FROM IMPLEMENTATION OF TTIP PLAN AND LAFAYETTE PLACE DEVELOPMENT

Figure II.A.43

BOSTON REDEVELOPMENT AUTHORITY

Table II.A.29

Projected L_{eq} Noise Levels Resulting from TTIP Plan and Lafayette Place Project

Street Segment	Projected P.M. Peak Hour Traffic Volumes		Lafayette Place Traffic Contribution	Projected Noise Levels L_{eq} dB(A)
	Auto	Bus/Truck		
Chauncy St., from Summer St. to Bedford St.	198	30	28	75 (1)
Chauncy St., from Bedford St. to new arterial	293	30	123	75 (1)
New arterial, from Chauncy St. to Harrison Ave. Ext.	787	30	177	78 (2)
New arterial, from Harrison Ave. Ext. to Washington St.	620	30	80	78 (2)
Washington St., from new arterial to West St.	670	29	80	80 (2)

---

(1) Based on existing Chauncy Street traffic noise levels, adjusted by a 50% reduction in automobiles and 20% reduction in buses.

(2) Based on measured noise levels on Washington Street, with similar traffic volumes without buses, adjusted for the addition of buses.

8. Water Quality

a. Description of Existing Conditions

The Lafayette Place project area is an inland urban site located approximately 0.6 miles from the Boston Harbor and does not contain any bodies of water, wetlands, aquifer areas or any other water resources. Therefore, the sole impact of the project on water quality would result from sanitary sewer discharges and storm water runoff generated by the proposed development.

Within the downtown area, all of the sanitary sewer discharges and most of the storm runoff are combined in a common pipe system and are carried through either the East Side or West Side Interceptor to Columbia Circle in Dorchester, where they are picked up by the Metropolitan District Commission (MDC) system and sent to the Columbia Park headworks. At the headworks, the dishcarges are screened to eliminate large debris and are then sent, via the Boston Main Drainage Tunnel, to the MDC's Dear Island Sewage Treatment Plant for primary treatment and chlorination prior to discharge into the Boston Harbor. Two outfall pipes extend to the vicinity of Deer Island Light in the President Roads Channel at a depth of 50 feet MSL, and two relief discharge outlets are provided near the shore. The Deer Island plant has a design capacity of 343 MGD average flow and a maximum flow capacity of 925 MGD. In 1975, the plant handled an average flow of 299 MGD, and the projected demand in the year 2000 is 380 MGD. At present, the Deer Island Treatment Plant removes only 34 percent of the pollutants in the waste water (measured as biochemical oxygen demand (BOD)).

Currently, this area of Boston Harbor is classified as "SB" in relation to water quality standards.[1] However, recent studies indicate that the water quality in the area is poor and that the bottom sediments are contaminated. In a report entitled, Structural Evaluations and Ecological Observations in Boston Harbor, presented to the Engineering Division of the Metropolitan District Commission in March, 1973, by TCE, Inc., it was noted that the "new outfall" at the Deer Island Treatment Plant was no longer efficient in its operation due to numerous buried or occluded diffuser ports, resulting in some sludge contamination of the surrounding sea bed and anaerobic conditions of portions of the sea floor. (The old iron outfall, on the other hand, was found to be in generally satisfactory condition, with no evidence of sludge accumulation in the vicinity of the outfall and very little sediment. A moderate amount of marine life was observed, including sea anemones, barnacles, and starfish, and abundant number of flounders.) A bacteriological analysis of the effluent plume, conducted to investigate the presence of health hazards, found the expected coliforms and protei, which present the primary hazards of gastroenterites and superficial skin and mucous membrane infections. Although no Salmonella typhi, the typhoid fever pathogen, were isolated, their pressence in Boston Harbor water, especially during warmer weather, was not ruled out. The presence of disease-causing enteric bacteria indicates that the chlorination procedures used at the plant are not satisfactory to kill all potential disease-causing organisms. The above observations have also been bourne out by water quality measurements taken in 1972 at Deer Island-White "A" Gong Buoy by the Massachusetts Division of Water Pollution Control (Appendix Q).

---

[1] An "SB" designation indicates that the waters are "suitable for bathing and recreational purposes including water contact sports and industrial cooling, have good aesthetic value, are an excellent fish habitat and are suitable for certain shell fisheries with depuration (Restricted Shellfish Areas)". (Massachusetts Water Quality Criteria, Massachusetts Division of Water Pollution Control).

During heavy storms, the existing sewer and drainage system in the City is inadequate to handle the combined sanitary sewer and storm runoff flows. As a result, raw sewage, even though it is heavily diluted with storm runoff, flows directly into the Boston Harbor, the Fort Point Channel, and the Charles River through more than 200 outfalls built into the older sections of the City's sewer system to prevent sewage backup. These discharges have contributed significantly to the pollution problems of these bodies of water.

Overflows from the Lafayette Place project area discharge into the Fort Point Channel, the existing water quality conditions of which are extremely poor (see Appendix Q). The present water quality classification is given as "SC" for the area,[1] which is an established goal that obviously is not being met. A 1967 study by the Federal Water Pollution Control Administration (Biological Aspects of Water Quality - Charles River and Boston Harbor, Massachusetts) and the aforementioned MDC study indicated that the Fort Point Channel was intensely polluted and septic sludge deposits were more than three feet deep, covered by oily muck and emitting foul odors of hydrogen sulfide. The highest percentage of organic carbon (23.5) and organic nitrogen (1.29) associated with harbor sludges were found in the Fort Point Channel. The studies further noted the absence of any bottom - associated organisms and the total lack of marine life.

Several major steps at the Federal, state, and local level have been and are being taken to alleviate the present situation. Since 1974, it has been the policy of the City of Boston to separate the storm and sanitary discharge systems for all new construction. Under this sytem only the storm runoff will outfall into the harbor and surrounding waters, and all sanitary sewer discharges will be sent to the MDC for treatment. In addition, in 1967 the City

---

1. For a "SC" designation, water should be "suitable for aesthetic enjoyment, for recreational boating, and as a habitat for wildlife and common food and game fishes indigenous to the region". (Massachusetts Water Quality Criteria, Massachusetts Division of Water Pollution Control).

developed a master plan to increase the carrying capacity of the main interceptors. This plan was updated in 1972 and more recently was amended by the City's consultants, Camp Dresser McKee Inc., which revision includes amendments to cover the critical urban renewal areas.

Under the City's urban renewal program, a completely separated sanitary sewer and storm drainage system has been built in the Government Center Urban Renewal Area, and this separation is now being extended throughout the adjacent Waterfront renewal area. Most of the Central Business District, however, remains as a combined system. Furthermore, the City and the Redevelopment Authority have begun, through EPA funding, a comprehensive improvement program of the East Side Interceptor, North and South Branch, and of the Boston Main Interceptor, as well as additional separation in the renewal areas, all of which will increase carrying capacities to Deer Island and thereby reduce harbor pollution. The City of Boston also is participating in a Federal program to control outfalls into the harbor near the Charles River. Under this program, the type and concentration of pollutants dumped into the harbor will be strictly controlled.

At the state level, the MDC has entered into two agreements with the Environmental Protection Agency to provide, by 1985, secondary treatment of all sanitary sewer discharges dumped into Boston Harbor. Secondary treatment, which removes 85-90 percent of the pollutants, thus should result in a cleaner effluent and a corresponding improvement in the quality of the water in the vicinity of the Deer Island outfalls. In addition to being upgraded, the Deer Island Treatment Plant is expected to be expanded in capacity as well.

b. Impact of the Proposed Project

The proposed Lafayette Place development is not expected to have any significant impact on water quality conditions of the Boston Harbor and surrounding waters. Any new sewer facilities provided by the project would be constructed as separated systems. However, until the entire downtown area has been separated, any improvements at Lafayette Place would have virtually no impact on reducing the current pollution problems. Since the project site is nearly entirely paved or occupied with buildings, there will be no noticeable increase in storm water runoff from the site following completion of construction; therefore, pollutant loads from the area would remain the same. However, with the removal of large areas of surface parking, there should be a reduction in auto-related pollutants in the surface runoff.

During the construction period, water quality potentially could be temporarily impacted at overflow conditions. An increase in suspended solids in the surface runoff could result from site clearance and excavation activities, building demolitions, and from wetting down the site to reduce dust emissions. If chemical stabilizers are used, the potential for additional water pollution would exist. In addition, the pumping of water which has collected on the site from storm events or groundwater infiltration into the City's storm sewer system would also adversely impact wate quality, unless suitable precautions are taken, such as the use of equipment designed to trap or reduce the discharge of solids into the drainage system. However, since the ratio of the volume of discharge water from the site to the volume of the receiving water would be extremely small, the impact of suspended solids load on the quality of the harbor waters would be insignificant. Further increase of pollutants in the urban runoff could occur along the haul routes of the material excavated from the site, due to the potential for spillage from the dump trucks. Based on EPA data, it is estimated that the maximum amount of potential spillage could be 0.11% of the total excavation material, or a maximum of 263.8 tons. Such spillage can be minimized or eliminated by not filling trucks above their tops and by securely covering the loads before leaving the site.

In order to prevent possible pollution from oil residue, all used oil from on-site truck and heavy machinery utilization should be collected in closed containers and properly disposed of off-site.

During the construction period, all sanitary wastes generated will be collected in sanitary toilets connected to the existing on-site sanitary sewer lines or in chemical toilets. This could result in a sewage load of 8,750 gallons per day during the peak labor phase of 175 on-site workers, based on a design wasetwater load of 50 gallons/day/worker. Since the majority of the construction workers would probably live in the Boston metropolitan area, there would be a minimal incremental load on the MDC system.

Sanitary wastewater from the Lafayette Place project after completion is estimated at 394,765 gallons per day, or 0.395 MGD (some minimal drainage from the underground garage would also be added to this discharge.) When compared with the current load at the Deer Island Treatment Plant of 299 MGD, the contribution from the project would represent a 0.13 percent increase in demand. This addition is not expected to have any significant adverse impact on the water quality surrounding the treatment plant, although it will contribute slightly to the already poor quality of water in the vicinity of the outfalls. However, this would only be a temporary condition pending the upgrading of the Deer Island facility to provide secondary treatment.

9. Wind and Shadow Effects

a. Wind Effects

The determining criterion as to whether a development proposal will adversely impact the grade level environment with respect to wind is the extent to which the wind conditions on the site before development may be aggravated by the configuration of the proposed development.

In general, wind conditions are aggravated as a function of building height. There are, of course, many variables in the configuration of a building which affect wind conditions and even relatively crude information as to the behavior of wind can only be determined by wind tunnel simulation tests. However, with buildings which are over about 200 ft. in height and which present a full height vertical element or facade to a grade level pedestrian area, there is certainly the potential for adverse wind conditions. Building shape, such as a complex configuration or a circular tower, or grade level areas protected by means of arcades, sheltered spaces, etc., or a setback of the tower from affected areas are all factors which could nullify or mitigate potential adverse wind impacts.

The Lafayette Place development at present proposes an approximately 400 ft. hotel tower abutting Chauncy Street, and as the above discussion would suggest, there could be an adverse impact due to possible aggravated wind conditions at the base of this tower which would affect the pedestrian environment associated with Chauncy Street.

The location, height and configuration of the hotel tower are all subject to change as its design is refined. When the basic design of the tower has been finalized, it will be a condition of the BRA's design review process that a complete wind tunnel simulation analysis be carried out by the developer to ensure that there is adequate protection to the pedestrian environment from any potential aggravation of wind conditions which could be caused by the proposed design.

b. Shadow Effects

Similar to wind, adverse environmental impacts caused by shadows are primarily a function of the height of any proposed development. The criterion for establishing whether there is an impact is whether a public open space, park or plaza is subject to shadows cast by the proposed development for an unacceptable length of time during any day. (Public sidewalks do not fall into this category as their use by the public is for transition in comparision to the more static use by the public of formalized plaza and park areas.)

The closest public open spaces to the Lafayette Place development are the Boston Common and the Winthrop Square mini-park. Both these spaces are approximately 1,000 feet away from the 400 ft. high hotel tower proposed by the development. Although the tower will cast shadows for part of the day, especially in the period around the winter equinox, the ratio of 400 ft. height to 1,000 ft. distance, as well as the relative slimness of the tower, will almost certainly cause little or no shadow impact on these spaces, particularly in comparision to the shadows cast by buildings immediately abutting the Boston Common and Winthrop Square and by those towers which are closer than 1,000 ft. (e.g., Tremont-on-the-Common in relation to the Common and 100 Summer Street in relation to Winthrop Square).

The hotel tower will, however, cast a morning shadow on the interior circular open space of the shopping center, as will the surrounding retail structure at various periods during the day and for varying distances, depending on the time of day and season of the year. While the shopping mall will be a public open space, its use will be more related to access than to a resting place (although it will have the later function also) and the shadow impact will not be overly critical. Shadow impacts will be least during the summer days, when the mall would have its greatest use. The proposed open space adjacent to the Hayward Place garage, being south of the retail/hotel complex, will not be affected by the new construction, but will be impacted in the early morning hours by the garage building itself.

Part II.B. SOCIO-ECONOMIC ENVIRONMENT

1. Character of the Community

a. Description of Existing Conditions

The Lafayette Place project is located on the southern edge of the retail core of the Central Business District of Boston. The project area and its surroundings are primarily a non-residential business community containing a mix of retail stores, consumer services, offices, places of entertainment, restaurants, and other commercial activities. In addition, there is a small grouping of textile industry uses southeast of the site, the City's adult entertainment zone to the south, and residential nodes to the south and east (Chinatown) and west. The daily population is largely made up of shoppers, office and retail workers employed in the area, tourists and other visitors, and out-of-town businessmen. It is estimated that the average daytime population in Boston's downtown (Central Business District) is slightly over 250,000 persons. The nighttime population consists of residents and consumers of entertainment activities.

Although the project area and surrounding areas are predominantly commercial, there does exist a small residential population. According to the 1970 Census, 1,209 persons resided in Census Tract 701, which includes the project site, the retail core and financial district, and the northern part of the Chinatown section. One percent of this population was Black and an estimated 26% were Oriental; 7% were under 18 years of age, and 23% were 62 years old or over. A total of 920 housing units were reported, 80% of which were rental apartments. The major apartment complexes in the area are the 374 luxury unit Tremont-on the-Common, one block west of the project site, the 87 unit mixed-income Chauncy House one block to the south, and the 268 unit Touraine Apartments at the corner of Tremont and Boylston Streets. Construction is expected to begin shortly on an 128 unit elderly development (Section 8) at 80 Mason Street, involving the conversion of the former Boston Herald-Traveller building. The Chinese residential community, three blocks to the south of the Lafayette Place project, contains approximately 500 families, primarily of low to moderate income.

Within the environs of the project area are the city's financial district, Government Center - a major nucleus of Federal, State, and City governmental offices built under the urban renewal program - and a revitalized Waterfront area with the highly successful Quincy Market shopping mall to the north, and the historic Boston Common, a 48-acre public park servicing downtown shoppers, residents, employees, and visitors, as well as the metropolitan area, to the west. South of the project area is the South Cove renewal area, which includes the Tufts-New England Medical Center development and other institutional uses as well as Boston's upgraded theatre district, both of which serve to reinforce the activity base of the downtown. On the east are South Station, one of the city's two railroad terminals, which is undergoing planning for conversion to a major transportation center, and the Leather District, once a center of the leather industry but today a mix of small retail shops, marginal manufacturing operations, warehouses, and vacant buildings.

Retail Core

The retail core, together with the adjacent financial district, is the major employment and commercial center for the Boston metropolitan area. As is typical with a central business district, there exist a wide variety of employment levels and types with retailing and office jobs predominating. Although accurate figures are not available, it is estimated that total employment in the downtown is approximately 180,000 office workers and nearly 30,000 retail employees. Retail facilities within the CBD number an estimated 1,020 occupying approximately 5 million square feet of space (1972 estimates).

Downtown Boston is also the largest "shopping center" in the New England region. It has the greatest variety of merchandise and is, therefore, the most suitable place for comparision shopping. As a result, its stores are estimated to attract nearly 50,000 shoppers every day. The Central Business District, which is the focus of the City's retail activity, contains three types of retailing - the department store, speciality stores, and "ancillary" retail. The downtown department stores - Jordan's, Filene's, and Kennedy's, and including Woolworth's variety store - are the most important economically and account for slightly over 45% of the CBD sales. Speciality shops -those stores with a single focus - are found throughout the CBD, but many have located between Tremont and Washington Streets, where they benefit from clustering together and from the drawing power of the nearby department stores. The third type of retailing - ancillary retail establishments such as drugstores, office suppliers, restaurants, and the "discount" stores like CVS - depends primarily on the business activity of the downtown. Retail sales in 1972 totaled $404 million (1970 dollars), which represented 26.6% of the City of Boston retail market and 6.3% of the SMSA market (seeTables II.B.1, II.B.2).

Besides the major department and variety stores, other retail activity in the downtown includes clothing, shoes, jewelry, cameras, records, and books. In recent years, branch banking has grown considerably in the use of ground floor space. Dining and entertainment are also well represented in downtown Boston. Several new restaurants have opened in the area including a French restaurant in the city's former City Hall, complete with an outdoor café-style dining area. The Parker House on Tremont Street remains a first-class hotel and a center of evening activity with its bars, restaurants, and social functions. The Boston Opera Company is headquartered in the former Orpheum Theatre, and along Washington Street are several movie theaters.

Table II.B.1

A SUMMARY OF RETAIL SALES TRENDS IN THE CBD AND METROPOLITAN MARKET FROM 1948-1972, WITH PROJECTIONS FOR 1985

(Millions of 1970 Dollars)

	1948	1958	1967	1972	1985	
					Low	High
Central Business District	$ 664	$ 521	$ 464	$ 404	$481	$590
City of Boston Total	$1,583	$1,605	$1,599	$1,520	$1,916	2,035
Percentage of Sales in CBD	41.9%	32.5%	29.0%	26.6%	25.1%	29.0%
Boston SMSA Total	$3,318	$4,201	$5,278	$6,388	$9,318	
Percentage of Sales in CBD	20.0%	12.4%	8.8%	6.3%	5.2%	6.3%

Sources: U.S. Census of Retail Trade, Major Retail Centers, 1948. 1958, 1967 and 1972.

BRA Research Department, 1985 projections.

Table II.B.2

CBD RETAIL SALES
(Millions of Dollars at 1970 Prices)

	1948	1954	1958	1963	1967	1972
Shoppers Goods[1]	472	427	362	340	333	258
Miscellaneous Retail[2]	91	80	79	71	63	76
Food	31	19	16	18	15	18
Restaurants	70	65	64	63	53	52
Total Retail	664	591	521	492	464	404

---

[1] General merchandise, apparel, furniture, department store sales.

[2] Drugstores, liquor, book, camera, sporting goods, antique, gift stores, etc.

Source: Census of Retail Trade, Major Retail Centers, 1948-1972.

Despite a 14 percent constant dollar decline in total sales volume reported for the five years prior to 1972, the retail environment today in downtown Boston appears to be strong. The phenomenal success of the new Faneuil Hall Marketplace (averaging $300 in sales per square foot) has exposed a retail market potential not captured in the downtown for many years. According to Sales and Marketing Management magazine, median household effective buying income in Boston in 1975 was $11,280 and in 1976, $11,515. With over 215,000 households in the City, Boston's resident effective purchasing power approaches $2½ billion annually. And with historically high office vacancy rates of around 10%, developer interest in the retail trade has intensified. Vacant ground floor retail space is minimal, and major retail establishments are showing a future commitment to downtown with the reconstruction or renovation of facilities and continued promotion and support of downtown outlets. At the same time, the City is committed to the revitalization of the retail core and has invested in the widening and weather protection of sidewalks, tree plantings, and construction of mini-parks. Plans are nearing completion on a major program to restrict several blocks of Washington, Summer, and Winter Streets to pedestrian use.

Adult Entertainment District

Immediately to the south of the Lafayette Place project area is the City's adult entertaiment district, commonly known as the "Combat Zone". Established in 1974 as a special zoning district, this area covers a two block section of Washington Street and extends from midway between Avery and Boylston Streets almost to Kneeland Street. Zoned into this area are the so-called adult entertainment uses - "honkeytonk" bars and nightclubs, pornography shops, adult book stores, and X-rated movie houses. The district was set up so that this type of entertainment could be prohibited in all other districts of the City, as well as to facilitate the policing of such activities.

The existance of the Combat Zone has been an obvious detriment to the private redevelopment of the City's retail district. The original intentions in setting up the zone have not been entirely successful, and the area and its immediate environs have been plagued with illegal activity, a high crime rate, and a decline in property maintenance. It has created a degree of investment apprehension in the area which, unless arrested, can only result in further physical deterioration of the downtown.

Chinatown

Chinatown has served as the social, commercial, and residential core of Boston's Chinese community for almost 100 years. It is one of the most densely populated areas of the City and the heart of the City's garment industry. Approximtely 2,000 persons live in Chinatown, which consists of the Beach Street area (the commercial center at Harrison Avenue and Knapp Street, and the residential area of Oxford, Hudson and Tyler Streets and Oxford Place), and the adjoining eastern half of the South Cove Urban Renewal Area. Chinese commercial activity in the area, in addition to being a major source of Chinese employment, frequently provides the only source of indigenous Chinese goods and services in New England.

Chinatown is characterized by extensive overcrowding and congestion. Open space is very limited, and pedestrian and vehicular traffic is heavy. In particular, frequent traffic congestion along Beech Street and Kneeland Street is a nuisance and only adds to the already excessive air pollution in the area, which has delayed the construction of much-needed housing. The northern edge of the community contains several large warehouse and loft-type buildings abutting narrow streets. From Beech Street south, this neighborhood is predominantly three and four story brick rowhouse structures with commercial space on the ground floor and in the basements and residential units on the upper floors.

A BRA analysis of land use in this area revealed that the area is heavily built up, even by downtown standards, with little vacant land, and much of that (35,000 square feet) is devoted to surface parking. Industrial and commercial uses predominate, accounting for over 70 percent of the gross floor area, with residential and community uses intermingled. The result is a complicated mix of activities, both from parcel to parcel and vertically within buildings.

About one-fourth of the 490,000 square feet of space is used for restaurants, grocery stores, gift shops, and food processing concerns that are primarily located on lower floors of buildings. Nearly one-third of the space serves residential uses, and the remaining space is divided between community uses and non-Chinese rental of space.

The garment industry has been part of Chinatown almost as long as the Chinese. Garment related activity in the district includes the manufacture, wholesale and retail of clothing articles, accessories and textiles. In addition, service companies to maintain garment industry equipment, and ILGWU union offices are also located within the district boundaries. The garment industry owns 30 larger buildings encompassing 400,000 square feet. Although it is a major activity, the garment industry has been declining in importance in recent years.

Overall, the Chinese community is quite poor, with the average family income in 1970 being $5,400 (one of the lowest in the City) and 63% of the families earning less than $6,000. It is estimated that 60%-80% of the residents do not speak English, which creates particular problems in the job market. Although the rate of unemployment is low, much of the labor force is felt to be underemployed. Because of its family base, Chinatown is more stable than other downtown neighborhoods. Recently, according to BRA planning studies, the neighborhood's population has been rising rapidly due to changes in the immigration laws which have allowed more Chinese families to migrate to this country. This recent immigration also has substantially changed the social character of the community from a community somewhat characterized by single, middle-aged and elderly men to a more family-oriented society. Generally, the new families are larger than the City-wide average.

The recent immigration has placed a heavy demand for housing near the heart of the community; this, together with the lack of enough new housing and the area's low incomes, have resulted in a severe housing shortage. The 1970 census showed that 72% of the households had more than 1.01 persons per room versus the City average of approximately 10%.

In past years, the Chinese community has felt increasing pressures from outside development, especially the construction of the Southeast Expressway and Massachusetts Turnpike Extension, which required the demolition of large numbers of housing units, and the more recent expansion of the Tufts-New England Medical Center. Currently, many of the residents are apprehensive about the potential effects of further development proposals, such as the Park Plaza renewal project and the Lafayette Place development, which could place severe constraints on the expansion of the community as well as increase pressures from speculation and rising property values. Potential encroachment of undesirable activities and crime from the adjacent Combat Zone also threaten this community.

b. Impact of the Proposed Project

The potential users of the Lafayette Place project - shoppers, sales personnel, office workers, and visitors - are the same as most of the surrounding social environment; therefore, the proposed retail/hotel mix of the project will serve to reinforce the present community characteristics. Replacement of the underutilized and inefficient space and buildings presently occupying the site with a modern complex will provide a quality shopping, working, and visiting environment for these potential users as well as aid in the revitalization of the downtown by adding new hotel and retail space at a prime location. Conceived both to contribute to and to benefit from the City's present development thrust and private market realities, the Lafayette Place project can play a significant role in meeting the needs of the people of Boston for job opportunities and higher levels of income and the continuing improvement of the downtown economy. The retail component of this mixed-use development will serve the large number of visitors, hotel guests, and employees in this complex and will benefit in turn from the variety of activities located in the vicinity which draw clientele from other parts of the City and from the suburbs. The retail concentration within Lafayette Place also can attract shoppers to the downtown by virtue of its proximity to existing retail and through the quality of its products and its atmosphere, thus having a further beneficial impact on consumer business in the downtown area.

Potential adverse impacts on the social environment will occur primarily during the demolition and construction phases of the project, and would include temporary disruptions to pedestrians and patrons of adjacent buildings, increased dust and noise levels, short-term disruptions of the traffic flow on adjacent streets, and possibly an unpleasant aesthetic environment due to the construction activities (although the actual erection of the buildings can be an exciting visual experience). Pedestrian disruption will be particularly significant, since it will involve the closing of sidewalks along the site boundaries or the narrowing of pedestrian circulation space during the majority of the construction period. This in turn can create increased potential safety hazards, not only from the demolition and construction activities but also from greater possibility of conflicts with vehicular traffic. During this period, necessary precautions will be required of the contractors to minimize these short-term adverse impacts and to protect pedestrians and vehicular traffic from clearance and building activities. These include the erection of brows and canopies over sidewalk areas in compliance with City of Boston Building Department regulations relating to building demolition and construction, and the dismanteling of the existing buildings rather than the use of a steel ball.

Impact on Retail Trade

Traditionally, downtown Boston has served as the major shopping and entertainment center for the metropolitan area. Since World War II, however, the Central Business District has suffered from a steady decline in retail sales, due first to the shift in population to the suburbs and secondly to the subsequent emergence of large suburban shopping centers during the 1950's and early 1960's. The percentage of SMSA sales made in the CBD declined from 20% in 1948 to 6.3% in 1972 (Table II.B.1). Retail sales in the CBD have become more and more dependant on the downtown's "captive" market of office employees, core area residents, and tourists in the area. In more recent years, a growth in this market has begun to counterbalance the losses to suburban competitors and has resulted in some stabilization of retail sales in the downtown. Surveys by the BRA Research Department show that downtown office employees do about 60% of their shopping for items such as clothing in the downtown, and that downtown high-use apartment residents do about 80% of their shopping in the downtown.

Downtown retail activity has responded to the changes in the regional, market in several ways. In addition to the overall decline in downtown sales, there has been a reduction in the number of retail outlets (from 1,754 in 1948 to 1,017 in 1972), a process that is beginning to reverse itself with the success of the Faneuil Hall Markets development. The present composition of stores, which includes new high-grade retail space, is now experiencing a higher rate of sales per square foot, suggesting that an adjustment to the new market conditions has already occurred.

The downtown department stores, offering a more varied inventory than the suburban branches, have continued to prosper. Convenience stores (food stores, liquor stores, and to a lesser extent eating and drinking establishments), experienced a loss in sales in the downtown area as Boston's population declined, but these sections have begun to have a new growth with the recent increase in the captive market. (Those stores oriented to the needs of middle-class families, however, have continued to decline, as the City's population has shifted towards a younger, more affluent population.) Over the same period, several retail categories have faired relatively well, pointing to certain types of commercial activity for which the downtown retains a competitive advantage. Such categories include style and fashion goods (clothing, footwear, tailoring, and accessories) and the numerous specialty shops offering items of special appeal, luxury items, and one-of-a-kind goods. Mass entertainment facilities, such as the legitimate theatres and first-run cinemas, also find it advantageous to locate in the core of the region.

The future of downtown retailing is encouraging. Major investments recently undertaken by downtown retailers have demonstrated a favorable degree of commitment to the City's future and a confidence that profitable retail operations can be maintained, or even substantially expanded in scope. Within the last few years in the CBD, Filene's invested more than $3 million in the renovation of its existing facility and the construction of a four-story annex, Kennedy's completed a $1 million rehabilitation of its store, and Jordan Marsh committed $35 million for a complete modernization and consolidation of its downtown operations. The Faneuil Hall Markets in the Waterfront area, undergoing a $30 million restoration by the Rouse Corporation to house some 200 quality shops, boutiques, and restaurants, has experienced a phenominal success in that part of the project that has already opened. Spurred by this success, the Drucker Corporation presently is converting the former Gilchrist department store into a vertical mall.

Recent projections by the BRA Research Department indicate a significant growth potential for downtown retail sales by 1985 (Table II.B.3). The projected growth in the downtown's captive market of workers, residents, and visitors is expected to produce proportionate gains in retail sales. Moreover, sales should benefit from an increase in disposable incomes, both as the real earnings of American families rise and as the downtown begins to house a greater concentration of the city's more affluent inhabitants. By 1985, this larger and wealthier captive market is expected to account for an additional $105 million annually in retail purchases, compared to 1972.

At the same time, the downtown must continue to hold its share of the metropolitan area market and attract large numbers of suburban consumers if there is to be a genuine revitalization of downtown retailing. To a large extent, the ability of downtown retail establishments to attract other city and suburban shoppers will depend on the "drawing power" of such major new developments as the Faneuil Hall Markets, Park Plaza, and Lafayette Place. If these projects can create an image of the CBD as an exciting place in which to shop, suburban residents need only do a fraction more of their shopping downtown for the total sales volume downtown to increase. (On the other hand, too much new retail space could create excessive new competition at the expense of older retail districts and at the expense of each other.)

Table II.B.3.a

CBD SALES PROJECTIONS, BY MARKET SEGMENT
(Millions of dollars, constant 1970 prices)

Retail Market	1972	1985	
		Low	High
Employees	$ 83	$150	$150
Visitors	44	52	52
Downtown Residents	79	121	121
City Residents Outside Downtown	101	89	128
Suburban Residents	97	69	139
Total	$404	$481	$590

Table II.B.3.b

PERCENT DISTRIBUTION OF CBD SALES BY MARKET SEGMENT

	1972	1985	
		Low	High
Employees	20%	31%	25%
Visitors	11%	11%	9%
Downtown Residents	20%	25%	21%
City Residents Outside Downtown	25%	19%	22%
Suburban Residents	24%	14%	23%

Sources: U.S. Census of Retail Trade, Major Retail Centers, 1972

BRA Research Department, 1985 projections

According to BRA Research Department estimates, if the CBD can maintain its present level of sales to suburban shoppers, and with the anticipated growth in the captive market, retail sales in the retail core could increase by as much as $186 million by 1985. Based on an average sales of $135 per square foot of net leasible retail space, this growth in sales could support an additional 1,370,000 square feet.[1] Since 1972, an estimated 200,000 square feet of retail space has been added to the downtown, and an additional 480,000 square feet is currently under construction or firmly planned for the near future (excluding Lafayette Place). Therefore, a potential demand for nearly 700,000 square feet of retail space is as yet unabsorbed.

Lafayette Place, with its proposal for approximately 200,000 square feet of net leasable retail space, thus can have a beneficial impact in helping to fulfill this projected unmet demand. Full development of this retail component at Lafayette Place would represent a 29% share of the anticipated unabsorbed market.

Further perspective on the retail impact of Lafayette Place can be gained by examining the anticipated sales volume. Assuming an average sales of $135 per square foot of net leasable retail space, Lafayette Place would generate an annual total of $27,000,000 in retail sales. This amount would represent 4.6% of anticipated downtown retail sales in 1985, and 14.5% of the total increase in sales projected for the downtown.

Impact on the Hotel Market

The impact of the proposed hotel for the Lafayette Place project on the downtown hotel market is somewhat more difficult to analyze. New hotel development can generate, to some degree, its own demand through its ability to bring new business and convention trade into the City. For most large downtown hotels, their primary market is convention and business visitors. Although business visitors are a function of the general economic activities in a city, the convention business (particularly the larger conventions) is more closely tied to the availability of convention facilties and hotel accommodations.

An attractive city like Boston, with its large medical, educational and highly technical industries, would have a good opportunity to expand its convention business if it had adequate facilities to accommodate the larger conventions. At present, however, the strength of Boston's convention market is threatened by a serious lack of adequate hotel rooms and exhibit space to accommodate the larger, nationally oriented conventions. Nevertheless, Boston is still expected to draw as many as 300,000 conventioneers in 1978, 50% more than in 1977, who can be expected to spend upwards of $80 million in the City.

---

[1] Projections have used 1972 as a base.

Another important factor in generating demand for downtown hotel facilities is the national and international linkages of the hotels. Many conventions are booked directly through the large national hotel chains. A city which has several national convention hotels has a good competitive advantage for the convention business.

The present Central Boston (CBD and Back Bay) hotel stock of approximately 6,000 rooms is relatively strong. Boston has consistently had one of the highest average annual hotel occupancy rates of any major U. S. city, despite the addition of over 1,500 new hotel rooms since 1968.[1] In 1978, Boston's hotel occupancy rate is expected to reach 70% for the first time since 1969.

In spite of the substantial recent growth in new hotel space, Boston does not have adequate facilities to accommodate the large scale convention trade, according to the Greater Boston Real Estate Board, Bureau of Conventions and Tourism. A recent study of the Boston Redevelopment Authority[2] of the hotel/convention business in Boston indicated that there is a present need for 1,600-1,800 convention-oriented hotel rooms in proximity to the city's existing convention facilities. Based on a rule-of-thumb that one-half of a city's hotel rooms are available for a city-wide convention, an additional 3,200-3,800 hotel rooms would provide the needed increase.

Over the next ten years, some 5,500-6,000 new hotel rooms, including the 500 for Lafayette Place, are planned or have been proposed for the downtown/Central area of Boston. Of these, 1,850-2,000 have a better than probable chance of being constructed. Since some of these proposed hotels are planned as convention type hotels, Boston's ability to accommodate the larger convention trade should improve.

With the projected growth in the downtown's business activities, the steady increase in the City's tourist trade, and the improved potential for capturing larger scale conventions, Boston's hotel market should continue to be strong. The large, nationally-oriented hotel facility proposed for Lafayette Place thus would help to satisfy the present unfulfilled need for hotel rooms in downtown Boston, as well as to contribute to the expansion of the City's hotel market.

Impact on Employment Opportunities

As a result of the implementation of the Lafayette Place project, it is anticipated that a total of 2,608 new jobs will be generated, of which 1,467 or 56.3% will be short-term construction jobs and

---

1. Harris, Kerr, Forster & Co., "Trend in the Hotel and Motel Business", 1971, 1973.

2. Boston Redevelopment Authority, A Growth Strategy for Boston's Hotel and Convention Industry, Boston, May, 1977.

1,141 or 43.7% will be permanent jobs. One hundred percent of the construction jobs are expected to be upper income jobs, while all the permanent employment is expected to fall into the lower income salary range. A summary of the anticipated employment opportunities and basis of calculations is given in Table II.B.4.

It is expected that the Chinese community, which is located adjacent to the project site, will be encouraged and will seek entrepreneurial opportunities within the retail component of Lafayette Place. It is also expected that this proximity will enable a substantial share of the permanent jobs generated by the hotel and retail center to be available to the residents of Chinatown.

Impact on the Adult Entertainment District

The Lafayette Place project is expected to have both a direct and an indirect impact on the adjacent adult entertainment district. The introduction of an active and attractive retail/hotel complex should result in an immediate improvement in the physical appearance of this area. The project will generate the infusion of thousands of employees and consumers into this section of the downtown, thereby creating a more positive development and investment attitude towards the immediate Combat Zone area.

Together with the Tufts-New England Medical Center redevelopment program to the south of the Combat Zone and the proposed Park Plaza renewal project on the west, the combination of these three active development programs should result in a positive transformation of this entertainment district by way of private and public development incentives and attitudes. In addition, the possible siting of a new Federal Office building in the area should further act as an impetus to the revitalization of this remaining link between the Central Business District and the Prudential Center complex. At the same time, this would result in the secondary impact of shifting the adult entertainment uses to another locality within or outside the City.

Impact on the Chinese Community

As noted previously, implementation of the Lafayette Place project can have both a positive and a negative impact on the neighboring Chinese community, depending on the sensitivity of the project's relationship with Chinatown. The introduction of Lafayette Place will generate some 1,140 new service-type jobs in the retail and hotel sections, which should present substantial employment possibilities for the highly impacted Chinese community. The community is anxious to expand employment opportunities for its residents since the population is so dependent on the restaurant industry, which is rapidly reaching its saturation point, and on the declining garment industry. The early provision of job training programs for Chinese youths to learn construction skills would enable them to qualify for construction jobs in the Lafayette Place development. In addition, the City could assist the recently-formed Chinese Economic Development Council in creating a job-bank and should

TABLE II.B.4

LAFAYETTE PLACE PROJECT

Anticipated Employment Opportunities

	Low Income Number	Low Income % of Total	Middle Income Number	Middle Income % of Total	Upper Income Number	Upper Income % of Total	Total Number	Total % of Total
Number of New Jobs to be Created								
Construction/ Rehabilitation	0	0	0	0	1,467	100.0	1,467	100
Non-construction (Permanent)	1,141	100.0	0	0	0	0	1,141	100
Number of Permanent Jobs to be Retained	0	0	0	0	0	0	0	0
Total Jobs	1,141	43.7	0	0	1,467	56.3	2,608	100

Basis of Calculations

(1) Low, Middle and Upper income salary ranges

Mean salary total (1978) = $12,079

Source: County Business Patterns 1975, Massachusetts, U.S. Bureau of the Census mean salary per employee $10,150 in Suffolk, Norfolk, and Middlesex Counties combined; assumption of 19% inflation rate April 1975 to April 1978 based on U.S. Bureau of Labor Statistics Boston Area Consumer Price Index.

Based on the above:

Low income salary = 0 - 80% = $ 0 - $ 9,663
Middle income salary = 80% - 120% = $ 9,663 - $14,495
Upper income salary = 120% + = $14,495 +

(2) Permanent Job Generation Multipliers

Retail	--	300 sq.ft. per worker
Hotel	--	4 rooms per worker
Maintenance	--	(estimate)
Parking	--	250 spaces per worker

Table II.B.4 (cont'd)

(3) 1978 Annual Salary for Selected Job Types

Retail	7,200
Hotel	8,600
Parking Garage	6,800
Building Services (Maintenance)	7,000

Source: County Business Patterns, 1975, Massachusetts; Assumption of 19% inflation rate April 1975 to April 1978 based on U.S.B.L.S. Boston Area C.P.I.

Total wages assumed at 45% of total construction cost.
Average annual wage for contract construction worker--$17,500.

Construction worker annual salaries were estimated at $17,500 per year given 1975 County Business Pattern data adjusted upward for three years' inflation. This figure suggests that all construction jobs generated by the proposed project will fall into the high income category. However, this condition seems highly unlikely given variations between construction trades and seasonal employment.

make certain that developments such as Lafayette Place draw on the local labor supply. This could be effected by having job opportunities posted on the site or by setting aside some of the jobs for local residents.

Lafayette Place can have a further beneficial impact on the neighborhood if it is seen as a connecting link between the retail core and Chinatown, and an effort is made to encourage Lafayette Place patrons to visit and patronize the Chinese community. As such, it could have a very positive effect on the Chinatown restaurant trade and other Chinese retail operations. This linkage could be strengthened further by providing some retail space within Lafayette Place to Chinese merchants. More importantly, the City can reinforce this relationship by cleaning up the public space between Lafayette Place and Chinatown, constructing new sidewalks and installing better street lighting, and by providing more conspicious police protection, so that Lafayette Place patrons would not feel apprehensive about walking to Chinatown, especially after dark.

Potential adverse impacts on Chinatown could result from increased vehicular traffic generated by the proposed project and from pressures for more intensive land development within Chinatown. Since the Chinese community is the nearest residential neighborhood, one very immediate impact of additional traffic, besides further congestion of the already overcrowded streets, would be the further deterioration of the area's bad air quality. This would increase the health hazard of those residents of Chinatown, especially the many elderly who live here, and could discourage tourists from visiting the area, many of the merchants and residents of which depend on tourism as a major source of income. It should also be noted that implementation of the City's TTIP project will further aggravate the area's traffic situation by reassigning considerably increased traffic volumes along the Stuart/Kneeland corridor.

These problems could be mitigated substantially by ensuring that Lafayette Place traffic circulation is designed around Chinatown. The possible closing of Beach Street, which is also a main pedestrian thoroughfare, would cut down the number of vehicles using that street as a bypass to the downtown, as well as discourage shoppers going to Lafayette Place from trying to avoid garage parking fees by parking on Chinatown's local streets. A program of reserving on-street parking spaces in Chinatown for the merchants, residents, and tourists would also ensure that these spaces are not used by Lafayette Place patrons.

With the development of Lafayette Place (and Park Plaza as well), a major concern is that Chinatown will be squeezed out by rising property values. The Chinese community has endured a history of encroachment by institutions and highways. At the same time that an increasing number of immigrants are arriving in Chinatown, the Lafayette Place development could trigger pressure for more intensive land development within the neighborhood. Furthermore, it could raise the value of property in the area, some of which the community is planning to acquire for rehabilitation, pricing the buildings out of reach of the Chinese.

Because of their language barrier, the Chinese community cannot give up their neighborhood in the face of development pressure and move elsewhere in the City. This barrier affects their employment opportunity as well as their dependence on "the neighborhood" for their social life and supporting services. It is thus important that the residents are able to remain in the neighborhood at rental levels they can afford. To ensure this, the City can use public policy such as downzoning to discourage real estate speculation in Chinatown. Furthermore, better public services such as street sweeping and trash collection would improve the appearance of the neighborhood, strengthen the tourist industry, and build neighborhood confidence. Such confidence would be important in spuring additional Chinese investment in the area, thus reducing the fear of high density development forcing Chinatown out of existance. Support by the City also will reinforce the recently announced plans of the Chinese Community to form an economic development corporation to implement a program to increase and upgrade the existing housing stock, improve economic opportunities, develop economic skills, and increase customer and client spending opportunities within Chinatown.

2. Community Facilities and Services

a. Description of Existing Conditions

Relevant community facilities and services (non-utility) servicing the Lafayette Place project area are furnished primarily by the City of Boston and include police and fire protection, emergency medical treatment, trash collection, and open space facilities. Since the proposed development does not include any residential uses, no demands will be placed on public schools or other residentially-related services.

Police Protection

The City of Boston Police Department is organized into 6 command districts, which in turn are further sub-divided into 15 districts. The project site is located within District 1, which includes the Central Business District and the North End-Waterfront, Beacon Hill-West End, and South Cove residential neighborhoods. As of January 1976, there were 216 uniformed officers assigned to District 1, which is stationed in a new facility on New Sudbury Street, approximately 3/4 mile from the site. The chief responsibilities of the police officers are crime prevention and criminal apprehension, traffic control, and emergency assistance. While the majority of the policemen are dispatched in police cruisers, there are in District 1 mounted police for the parks, theatre district, and the Washington Street retail district, motorcycle police for traffic control, and footpatrol for the shopping areas.

According to the Police Department crime analysis records, problems in the commercial area vary from prostitution, robbery, gambling, drug pushing, breaking and entry, and auto theft (all of which are associated with the Combat Zone) to shop lifting, purse snatching, and traffic control in the retail district and larceny of property in the office district (see Table II.B.5). Near the project area, the existance of the Combat Zone, as well as vacant lots, narrow alleyways, and inadequate lighting, acts to encourage street crime. In response to these problems, the City has undertaken a campaign not only to reduce the fear of crime but also the actual crime level as well. The key objectives of this campaign include the installation of brighter street lighting, the assignment of mounted officers to the theatre district along Boylston and Tremont Streets, and the establishment of special footpatrols for specific problem areas.

Traffic control duties are another aspect of special police involvement in the downtown. Several intersections with heavy traffic congestion, such as Washington, Summer, and Winter and Boylston/Tremont, regularly have traffic policemen assigned to them.

Table II.B.5

CRIME STATISTICS 1977

CITY OF BOSTON POLICE DEPARTMENT

CRIME CATEGORY	DISTRICT 1 TOTAL	DISTRICT 1 REPORTING AREAS 111*, 112, 117	CITY OF BOSTON
Criminal Homicide	5	0	100
Rape	40	8	408
Robbery	760	161	5,655
Aggravated Assault	373	56	3,284
Burglary (B & E residential and non-residential)	1,520	82	14,793
Larceny Theft	5,852	1,177	21,353
Auto Theft	3,946	258	21,427
Part II Crimes [a]	4,355	770	30,588
Part III Services [b]	3,908	699	62,520

* Arlington Street MBTA Station and 1 to 103 Stuart Street data are not included.

a. Part II Crimes - Lesser criminal acts: simple assault, receiving stolen property, indecent exposure, embezzlement, arson, extortion, prostitution.

b. Part III Services - Lost property, family disturbance, ambulance call.

Source: City of Boston Police Department, Bureau of Informational Services, Boston Police Incident Report, March, 1978.

Fire Protection

Fire protection service for downtown Boston is provided through Districts #3 and #4 of the Boston Fire Department. Both District 3 (east of Arlington Street and north of Essex Street) and District 4 (Back Bay and the South End-South Cove areas) have 10 companies (either ladder or engine) with 22-24 men assigned to each and at least four on duty at all times. According to Fire Department records, the total number of alarms (including false) in District 3 in 1976 was 2,876, or an average of 8 alarms per day. Approximately 10% of the total alarms represented building fires with actual loss; ten were working fires with additional equipment called and twelve were multiple alarms.

Fire stations that would respond to a first alarm at the project site include Engine 25, Ladder 8, and Rescue 1 at 125 Oliver Street, Engine 26 and Ladder 17 at 200 Columbus Avenue, and Engine 39 at 344 Congress Street. Water supply for firefighting, in the event of a fire, is available through low pressure mains and a high pressure fire service system which is reserved for fire department purposes only.

A variety of factors and programs control the risk of fires in the downtown. The vast majority of residential and commercial construction is masonry, brick, brownstone, or granite. All buildings in the downtown are inspected periodically for hazardous conditions which might cause fires, and public assembly places are surveyed in addition on a regular basis. Most of the high-rise structures have been identified and a fire-fighting strategy prepared as a part of the pre-fire planning program. Moreover, all new buildings are required to be of fireproof construction, have adequate sprinkler systems, and conform with all Fire Department regulations.

Medical Services

A large variety of medical services are available in or adjacent to the downtown area, including major hospital and research institutions, neighborhood clinics, private practitioneers, and specialized facilities. For emergency medical services, the Tufts-New England Medical Center is located only 3/8 mile from the site and is directly accessible via Harrison Avenue Extension. Also nearby are Boston City Hospital and the B.U. Medical Center approximately 1 3/4 miles distant via the Central Artery, and the Massachusetts General Hospital and Massachusetts Eye and Ear Infirmary, one mile to the north. Besides emergency services, these hospitals also provide a wide range of inpatient, ambulatory, and research services.

In the Chinatown area, the City supports the Chinese Community Health Center, which provides comprehensive primary care services. The Lindemann Mental Health Center is located in the Government Center area.

The Department of Health and Hospitals Ambulance Service provides emergency ambulance service to the downtown area on a twenty-four hour basis. Ambulance service is available either from the District 1 station or City Hospital.

Sanitation Services

The project area is part of Sanitation District 1 of the Boston Public Works Department, which operates out of a new facility on Dover Street. For waste collection in the downtown section of District 1, the City has contracted with Charles Lee Disposal Co., Inc., who retains his own equipment and personnel. The City's policy of permitting free dumping of refuse collected from commercial property by the same contractor who collects residential trash has resulted in Charles Lee Disposal Co. collecting about 80% of the commercial refuse in the downtown. Disposal of the collected trash takes place at the East Bridgewater Incinerator.

Street sweeping is organized under the Highway Division of the Public Works Department. There are 10 sweepers for the downtown area (5 per day, 5 per evening) and 2 contract sweepers. The downtown is swept every night up to Dartmouth Street and the remainder twice a week. Pushman Carts are used to supplement the sweepers; two are assigned to Washington, Tremont, and Cambridge Streets in the downtown. The cleaning of public sidewalks is the responsibility of the abutting property owners. Both the City's D.P.W. and Charles Lee Disposal share in the daily pickup of trash from the litter baskets and receptacles in the downtown area. The D.P.W. disposes at the Gardner Street landfill site in West Roxbury, which is nearing capacity.

Parks and Recreation Areas

The major recreation area servicing the Lafayette Place project area is the Boston Common, a 48 acre landscaped public park enjoyed by downtown visitors, residents, shoppers, and employees. Located approximately 600 feet west of the project site, the Common has been in continuous use since 1634 and forms one element of Frederick Law Olmstead's regional park system of the late 19th century. Recreational facilities located in the Common include a ball field, three public tennis courts, a tot lot, wading pool (the Frog Pond), an ice rink, and sitting areas. Inadequate maintenance of this heavily used park, due primarily to lack of funds, is a crucial problem.

In the vicinity of the project area are some small "vest pocket" parks, recently constructed, which provide sitting areas and landscaping. These includes Liberty Tree Park at the corner of Boylston and Washington Street, Filene's Park at Franklin and Washington Streets, the Charlestown Savings Bank park on Summer Street, and Winthrop Square. Under the City's public improvements program for the downtown, additional pedestrian areas are planned, including a mini-park at Phillips Square one block south of the project, and the Washington Street Mall.

The existing park system is augmented by a number of private recreational facilities located in the downtown, including the YMCU and various other health and athletic clubs.

Cultural and Religious Facilities

The city's four major legitimate theaters and the Music Hall are within a few blocks of the project site, as are several downtown movie theaters. Symphony Hall is about 1 1/2 miles away, and Boston's major museums are from one to two miles away; all are readily accessible by public transit. The main Boston Public Library is located in Copley Square, about 1 mile distant, and the Kirstein Business branch is near Government Center, 1/3 mile away.

Within a ten-minute walk of the project area are several churches that can provide for the religious needs of the project users, including St. Paul's Cathedral, St. James Church, St. Anthony's Shrine, Holy Spirit Chapel, Park Street Church and a synagogue.

b. Impact of the Proposed Project

The proposed Lafayette Place project should have minimal impact on community facilities and services. The existing police and fire stations serving the area are well equipped and have the capability to respond to any fire or other emergency at the site. Among the fire stations that would respond to a first alarm at the project site, the South Cove station on Columbus Avenue was constructed in 1970. The Tufts-New England Medical Center on Harrison Avenue, which is the closest hospital for emergency medical services, has undergone a major expansion program in recent years to improve its services. The Boston Common is less than a five minute walk away and can provide for many of the recreational needs of the project's users. Adequate equipment and facilities for street sweeping, trash collection, and maintenance appear to be available, the main problems being inadequate supervision of the sanitation employees and inspectors.

Police and Fire Services

Demolition of the vacant buildings now occupying part of the project site will have the beneficial impact of removing a potential public safety hazard (danger from fire and crimes against persons due to non-occupancy and lack of activity of the buildings). Redevelopment of the site will greatly increase round-the-clock activity in the immediate area and thus should result in a significant decrease in the incidence of street crime (although the potential for shoplifting and robberies would naturally increase).

The demand for future police services is not easily quantifiable, since crime analysis data suggests that there is no reliable correlation between population size or building type and crime levels. The Boston Police Department allocates men and resources based primarily on the number of calls for service, but there should be no problem in meeting the demand for service in the project area. There may be a need for increased traffic control as a result of the development.

The impact of the proposed project on fire services is expected to be positive. All available evidence, both local and national, indicates that incidence of fire is reduced substantially in new construction (although it is conceded that the severity-potential may in fact increase). In accordance with the State Building Code and the Boston Fire Code, a new building must be of fire-proof construction, have an adequate sprinkler system, and conform to all fire regulations. Further, fire suppression is aided by smoke control devices, centralized alarm systems, standpipes systems, and elevator safety devices. The result of such measures would be a reduction in fire probability and the demand for fire protection services over that of previous development on the site. The existing high pressure water supply system, which is reserved exclusively for fire-fighting, is considered to be adequate to protect the new development.

Park and Recreation Areas

Substantial open space for sitting and relaxing, as well as for pedestrian circulation, will be provided by this project. As presently designed, the retail center is planned with a large central circular mall, approximately 30,000 square feet in area, open to the sky, with landscaping, benches, and other amenities. Additional pedestrian open space is planned on the upper levels of the retail concourse, and in a public plaza, or mini-park, adjacent to the Hayward Place garage. Sidewalks will be of sufficient width to accommodate anticipated pedestrian traffic and may be partly covered by an arcade.

Sanitation Services

As with all commercial properties in the City, the owners of the Lafayette Place development will be required to contract with a private firm for collection of refuse. This service can be provided by Charles Lee, Inc., which presently collects in the downtown area, or by any number of other private contractors. The City will be responsible for street cleaning and the collection from sidewalk receptacles.

It is estimated that the amount of solid waste generated from the Lafayette Place project would equal approximately 14.46 tons per day or 5,278 tons per year (for basis of calculation, see Appendix R). Disposal of this solid waste would be the responsibility of the private contractor; however, Massachusetts laws require such disposal to take place only at sites approved by the Department of Environmental Quality Engineering (General Laws, Chapter 111, Section 150A, and Massachusetts Sanitary Landfill Regulations). In order to reduce the volume of waste generated by this project, the developer is exploring the use of a trash reduction system for the hotel, with possible extension to the retail complex as well.

Medical Cultural, and Religious Facilities

The proposed project is not expected to have any impacts on other public or community facilities, such as hospitals, libraries, and theaters, or to create any significant demands on these facilities. Therefore, the adequacy of existing facilities should not be exceeded.

3. Relocation

The Lafayette Place project will not require the relocation of any families or individuals or of any businesses. The existing parking lots presently occupying the project site are interim uses whose contracts will be terminated as per contract agreement. Therefore, no relocation sites will be required for these lots.

4. Economic Analysis

a. Description of Existing Conditions

In this section, the economic impact of the Lafayette Place development will be evaluated from two perspectives:

- The compatability of the new development with the City's immediate economic needs and its long-range growth and development strategy.
- The direct and indirect economic impact of the development on the city's economy and the surrounding downtown area.

Boston Development Strategy

There is a wide range of development and planning efforts underway in Boston, with a potential for achieving significant economic and social gains for the City and its people. The growth in jobs and the income they generate are basic to the progress Boston has been experiencing and are key to the larger goals for urban life which can be achieved in the 1980's. A main element of Boston's development strategy, therefore, centers on enlarging the City's role in creating jobs and generating income, thereby improving the opportunities for the population and making Boston a better place in which to live. Social gains for the city depend on favorable trends and prospects for the city's economy. These prospects are far from assured, however, because of the complex fiscal and, more recently, economic problems which endanger the potential for new jobs and improved living standards.

To assure the achievement of Boston's potential, the City must undertake major planning and development efforts that will enhance economic prospects by making the City a more attractive place in which to work as well as to live. The City is confronted with the challenge of meeting the needs of people and the economy, of responding to market opportunities and developer's pressures while protecting the environment, safeguarding historic landmarks and historic neighborhoods, and upgrading the standard of living for its residents.

The City's Economy and Population

Key to recent gains and future prospects of Boston's economy, with effects on jobs, income and the upgrading of the City's population, is the "service revolution"--the rising relative role of service activities in the City and in the nation. As service activities expand in the nation, responding to a rising demand for services as household incomes increased, Boston and other large cities took on a new and larger role in the economy.

Since 1963, Boston has gained 60,000 service activity jobs--more than offsetting a loss of 20,000 manufacturing jobs. The production of goods and services increased by one-third, and Boston now has $10 billion economy with more than 500,000 jobs.

Boston's population benefitted as the City's economy improved. The growth in jobs through the 1960's had a dramatic effect on household income in the City. Median household income rose by one-fourth (measured in constant value at 1970 prices). But Boston continued to have a relative concentration of the poor and growth in household income lagged behind the growth experienced in the metropolitan area. In addition, while the City's service industry continued to show modest gains, other segments, such as the construction industry have suffered severe setbacks in recent years. Continued efforts at increasing the availability of jobs and at improving income levels are needed in the City.

The Role of Downtown in Boston's Economy

The City of Boston has many needs in many areas, but above all, Boston needs continued economic growth, and key to enhancing the City's economic prospects is a viable, prosperous downtown.

The downtown area (which, in this following analysis, includes both the CBD and the Back Bay) makes up only 8% of the City's land area, but contains 60% of the City's jobs, 40% of the City's property value, 16% of the City's labor force and 12% of the 1970 population. In the 1960's, the downtown area accounted for virtually all the growth in the City's new office space (9 million square feet) and the related growth of City's 60,000 service jobs. In the decade ahead, it is expected again to play a critical role in helping meet the needs of the City and its people.

The direct and indirect economic benefits that will be generated by the Lafayette Place development will undoubtedly help meet the needs of a temporarily faltering economy. But in the broader context, the real significance of the new development is its reinforcement of the City's growth and development strategy, which fosters continued revitalization and expansion of the City's service-oriented economy in the downtown area.

b. Economic Impact of the Lafayette Place Development

The $71.8 million Lafayette Place development, in the center of the downtown retail district, will provide significant economic benefits, direct and indirect, for the downtown area and for the City as a whole. Like the Prudential Center development of the 1960's, the

Lafayette Place complex not only can provide the City with substantial, immediate economic gains, but the "spin-off effects" from the new development can provide critical reinforcement of the basic growth trends in the City's economy for the decade ahead.

The new commercial complex will increase job opportunities, generate new income, expand downtown retail sales, and increase tax revenues for the City of Boston. It will significantly upgrade and help revitalize the City's Central Business District by generating new economic activity in the Washingotn Street retail area. It will strengthen the vital role of the downtown core area in the City's expanding service-oriented economy and provide sorely needed economic stimulus for the regional economy.

The anticipated economic impact of the Lafayette Place is outlined in the following table (Table II.B.6), which evaluates, in a summary fashion, the direct public cost and the economic and tax revenue benefits generated by the new development at two time intervals: during the construction phase and after completion of the project.

It is anticipated that there will be little or no disruption of retail activity in the surrounding area as a result of construction activity on the site. The careful staging of the development, the availability of sufficient open land on the site for construction operations, and the distance from the most active pedestrian areas will all minimize disruption. (The Jordan Marsh department store, in fact, operated at nearly normal capacity during the construction and modernization phases of its development.)

In addition, any negative impact from the construction activity on local retailers should be more than compensated for by an increase in annual retail expenditures by construction workers on the project.

It is more difficult to evalate fully some of the indirect economic effects of a new development like Lafayette Place. Much of the impact on the City's economy from the new development will not be completely realized until several years after the development is finished. To a large extent the indirect impact depends on "nonquantifiable" effects, such as the degree to which the new development will renew confidence in the business community and ultimately generate new investment and expansion in the downtown area. Some indication, however, can be drawn from similar recent developments.

Based on the experience of the Prudential Center and Government Center developments, it is estimated that property values in the immediate area of the new development could increase by at least 30%. The increased property values and the overall economic vitality generated by the new development could stimulate an estimated $50 million of new investment within the surrounding area in new construction and rehabilitation of existing facilities. This upgrading of the surrounding retail area would generate further increases in sales, employment, income and tax revenues to the City of Boston.

Table II.B.6

Economic Impact of the Lafayette Place Development

Summary Table

A. Public and Private Investment:

Sector	Total Development Costs (In millions)	Construction Related Costs (In millions)
Private Investment	$ 41.250	$ 34.0
Public Investment	30.564	20.0
Total Investment:	$ 71.814	$ 54.0

B. Economic Impact from Construction Activity

1. Employment and Income:

	Construction Jobs		Construction Payroll (In millions)	
	Project Total	Avg. Annual	Project Total	Avg. Annual
Private Development:	922	230	$15.2	$3.80
Public Development and Improvements	545	136	9.0	2.25
Total:	1,467	366	$24.2	$6.05

2. Multiplier Effect from Annual Construction Payroll on Local and Regional Economy:

$12.10 million

3. Annual State Tax Revenues Generated from Construction Activity:

Tax	
Personal Income Tax	$ 242,000
Business/Corporate and Miscellaneous Taxes	217,600
Total Annual Tax Revenue Generated by Construction:	$ 459,600

C. Economic Impact of New Development When Completed:

1. Sales, Employment, Income

Development	Annual Sales (In millions)	Avg. Annual Employment	Annual Payroll (In millions)
Private Development	$ 37.6	1,133	$ 8.34
Public Development	-	8	.05
Totals:	$ 37.6	1,141	$ 8.39

2. Multiplier Effect on Local and Regional Economy from Annual Employment Payroll:

$16.8 million

3. Annual Tax Revenues Generated from New Development after Completion:

Tax	State	City of Boston
Real Estate	-	$ 1,000,000
Personal Income Tax	$ 419,300	
Retail Sales Tax	600,000	
Hotel Room Occupancy Tax	370,000	
Meals Tax	660,000	
Business/Corporate and Miscellaneous Taxes	240,000	
Total Annual Tax	$2,289,900	$ 1,000,000
Annual Parking Garage Revenues to City:		$ 1,800,000
Total Annual Revenues to City of Boston*:		$ 2,800,000

* After Year 22, following payment of debt service for Revenue and General Obligation bonds to finance portions of public investment.

D. Net Economic Impact on City of Boston Economy from Completed Lafayette Place Development:

	Current Level on site	New Development	Net Gain to City
1. Annual Sales	0	$ 37.6 million	$ 37.4 million
2. Annual Employment	10(est.)	1,141	1,131
3. Annual Payroll	$60,000	$ 8.39 million	$ 8.33 million
4. Total Annual Tax and Parking Garage Revenues to the City of Boston	$770,500	$ 2.80	$ 2.03

Notes for Table II.B.6

A. Public and Private Investment

Development and construction costs estimates furnished by Sefrius Corp. (private sector) and City of Boston (public sector).

B. Economic Impact from Construction Activity

1. Employment and Income

Construction employment and payroll based on total construction wages equalling 45% of total construction costs and average annual wages of $16,500 for construction workers. Time period for completing the project is 4 years.

2. Multiplier Effect

Multiplier effect on local and regional economy calculated by applying a multiplier of 2.0 to the annual disposable income from construction payroll.

3. Annual State Tax Revenues

Personal Income Tax - tax rate of 5% applied to 80% of total annual construction payroll.

Business/Corporate and Miscellaneous Taxes - based on assumption that 8% of gross business revenues represent taxable net income which is subject of an average effective tax rate of 8%.

C. Economic Impact of New Development When Completed

1. Sales, Employment, Income

Sales:

Retail:	based on $135 per square foot net leasable retail space.
Hotel:	based on average of $13,000 per room gross plus beverage and food sales at 62.5% of total room sales.

Employment:

Permanent job generation multipliers based on the following:

Retail - 300 sq. ft. per worker
Hotel - 4 rooms per worker
Parking - 250 spaces per worker
Maintenance - (estimate)
Management - (estimate)

Payroll:

Annual average salaries based on the following:

Retail	-	$ 7,200
Hotel	-	8,600
Parking Garage	-	6,800
Maintenance	-	7,000

(Source: County Business Patterns, 1975, Massachusetts, assumption of 19% inflation rate April 1975 to April 1978 based on U.S.B.L.S. Boston Area C.P.I.)

2. Multiplier Effect

Multiplier effect on local and regional economy calculated by applying a multiplier of 2.0 to the annual disposable income from permanent payroll.

3. Annual Tax Revenues

Real Estate Tax - based on Chapter 121A in-lieu tax payments of $800 per year per hotel room and 23% of gross income from retail space.

Personal Income Tax - tax rate of 5% of total annual income.

Retail Sales Tax - 5% of total retail sales, excluding clothing, meals, and food sales. Clothing sales estimated at 21.4% of total retail sales, meals at 26%, and food at 9% (based on composition of CBD retail market from U.S. Bureau of Census, Census of Retail Trade ,1972).

Hotel Room Occupancy Tax - 5.7% of room sales.

Meals Tax - 6% of estimated restaurant expenditures.

Business/Corporate and Miscellaneous Taxes - based on assumption that 8% of gross business revenues represent taxable net income which is subject to an average effective tax rate of 8%.

Annual Parking Garage Revenues - based on gross income of $1,500 per space (@ 1,500 spaces = $2,250,000) less operating expenses of 20% of gross income ($450,000).

D. Net Economic Impact on City of Boston Economy

1. Annual Sales (current) - site presently supports parking lots and garage and vacant commercial buildings.

2. Annual Employment (current) - estimated

3. Annual Payroll (current) - based on annual salary of $6,800 for parking garage worker and $5,500 for parking lot worker.

4. Total Annual Revenues (current) - based on current tax revenues of $683,600 and current net parking revenues of $86,918.

Obviously, it is impossible to quantify or even identify all of the spin-off effects from a large new development like Lafayette Place. The experience of the impact of the Prudential Center on the Back Bay area or of the Government Center urban renewal project on the old Scollay Square should, nevertheless, be appreciated.

Summary

In the final analysis, the City's $30.56 million investment in the Lafayette Place project will result in very substantial economic gains, direct and indirect, for the downtown area and for the City as a whole. In the case of the Lafayette Place development, it would appear that the long-run benefits to Boston's economy will adequately compensate the City for its initial investment and commitment in the project.

5. Municipal Resources

a. Description of Existing Conditions

The City of Boston currently obtains revenues from the Lafayette Place development site from real estate taxes and parking revenues. However, the extent of these revenues is severely limited due to the presence of vacant buildings, underutilized land, and the condition of the Hayward Place garage. The estimated value of the parcels of land within the Lafayette Place development site, to be acquired for this proposed development, are shown on Table II.B.7.

Table II.B.7

Estimated Values of Existing Lafayette Place Parcels

(1)	Jordan Marsh Annex Parcel Source: Nov. '77 appraisal for City	$3,987,975
(2)	Bristol Block Parcel Source: Nov. '77 appraisal for City	1,012,025
(3)	Bedford-West Parcel Source: BRA appraisal	1,200,000
(4)	Hayward Place Garage (City owned) Source: City/Cost of acquiring existing leasehold	400,000
(5)	Code Realty Parcel Source: City/Real Property Board	1,000,000
(6)	Boston Edison Parcel (part) Source: Feb. '75 apprasal for SEFRIUS	1,000,000
	Total Estimated Value	$8,600,000

The actual net revenues to the City of Boston in 1977 from these parcels is shown in Table II.B.8.

Table II.B.8

City of Boston Revenues From Lafayette Place Site in 1977

Tax Revenues (with abatements)	
Jordan Marsh Annex	$ 476,680
Bristol Block	83,000
Bedford/West Parcel	BRA Property-not taxed
Hayward Place Garage	COB Property-not taxed
Code Realty Parcel (1)	-0-
Boston Edison Property (part)	123,920
Tax Revenue Total	$ 683,600

(1) In tax foreclosure

Parking Revenues	
Bedford-West lot	159,516
less interest on HUD Notes	(72,598)
Net Income	$ 86,918
Hayward Place Garage (2)	-0-
Garage Revenue Total	$ 86,918

(2) Hayward Place garage lease of $60,000/yr. is in default due to poor condition of the mechanical elements and constant need to repair this equipment.

TOTAL NET REVENUES TO CITY	$ 770,518

b. Impact of the Proposed Project

The public investment of $30,564,000 required to complete the Lafayette Place project will be accommodated in three ways. An $8,000,000 UDAG grant will absorb part of the public development costs, and an additional $2,064,000 from HUD will fund the financial settlement of the Bedford-West Urban Renewal Project. These are direct grants and will not require the assumption of debt service by the City of Boston. The remaining $20,500,000 public investment will be financed by Revenue Bonds and General Obligation Bonds issued for a 20 year period by the City of Boston. The present construction schedule for the project will permit the staggered sale of these bonds over the first three years of the project construction period. The City, therefore, will be paying debt service on the public portion of this development for a 22 year period once the construction of Lafayette Place begins.

The net average yearly income to the City of Boston from all sources in the Lafayette Place project over this 22 year period is estimated to be $808,954 per year. This amount represents an increase of some $38,436 on the estimated 1977 income to the City of $770,518 from the existing site. Following Year 22, the City would realize the total annual revenues of $2,800,000

The procedures for estimating average net yearly project income are shown in Tables II.B.9 through II.B.12.

Although not readily quantifiable, significant positive increases in property values are expected to occur in the area immediately adjacent to the Lafayette Place site. A retail/hotel complex of this nature and size can be expected to cause a market and climate supportive of new retail activity above Washington Street and the adjacent cross streets to Tremont and Summer Streets. It can also support new housing within the immediate area of the Central Business District, as well as provide additional support to existing housing and retail uses.

The net effect of all of the above spinoff activities will be an increase in property values and tax revenues to the City over the long term.

Table II.B.9

Total Public Investment by Year

Year 1	
Acquistion	
Jordan Marsh Annex & Bristol Block	$ 5,000,000
Code Realty Parcel	1,000,000
Hayward Place Garage Leasehold	400,000
Boston Edison Parcel (22,500 sf)	1,000,000
Sub-Total, Acquisition	$ 7,400,000
Demolition	
Jordan Marsh Annex Building	$ 1,200,000
HUD Note Retirement (Bedford-West)	$ 2,064,000
UDAG Administration	$ 300,000
Total Year 1	$10,964,000
Year 2	
Construction	
Lafayette Place Garage	$13,200,000
Hayward Place Garage Rehab	100,000
Total Year 2	$13,300,000
Year 3	
Construction	
New East-West Arterial	$ 1,000,000
Project Street and Other Public Improvements	4,500,000
Consulting Fees	$ 600,000
UDAG Administration	$ 200,000
Total Year 3	$6,300,000
TOTAL PUBLIC INVESTMENT	$30,564,000

Table II.B.10

Annual Debt Service for Lafayette Place Project by year

Year 1

Acquisition and Demolition	
Total Acquisition and Demolition	$ 8,600,000
HUD Note Retirement/Administration	2,364,000
Less: UDAG Funds	(5,300,000)
Project Closeout Funds	(2,064,000)
Total to be Financed	$ 3,600,000
Assume 20 year Revenue Bonds @ 6¼% with 8.83% constant payment	
Annual Debt Service Over 20 Years	$ 317,880
Total Debt Service Over 20 Years	$ 6,357,600

Year 2

Construction	
Total New Garage & Hayward Place Garage	$13,300,000
Public Improvements	1,200,000
Consulting Fees/Administration	300,000
Less: UDAG Funds	(1,500,000)
Total to be Financed	$13,300,000
Assume 20 year Revenue Bonds @ ¼% with 8.83% constant payment	
Annual Debt Service Over 20 years	$ 1,174,390
Total Debt Service Over 20 Years	$23,487,800

Year 3

Construction	
Total Public Improvements	$ 4,300,000
Consulting Fees/Administration	500,000
Less UDAG Funds	(1,200,000)
Total to be Financed	$ 3,600,000
Assume 20 year General Obligation Bonds @ 6¼% with 8.83% constant payment	
Average Annual Debt Service	$ 317,880
Total Debt Service Over 20 Years	$ 6,357,600

Table II.B.11

Annual City Revenues Upon Completion of Project by Year of Start

Year 3	
Garage Revenue	
1,500 spaces @ 1,500 space	$2,250,000
less operating costs @ 20% gross	- 450,000
Sub total garage	$1,800,000
Total Revenue Starting in Year 3	$1,800,000
Year 5	
Taxes	
Hotel: 500 rooms @ $800/room	$ 400,000
Retail: 200,000 sf. NLA @ $3.00/sf	600,000
Total Revenue Starting in Year 4	$1,000,000
Total City Revenues by Year from Year 5 on	$2,800,000

TABLE II.B.12

Annual City Net Revenues upon Completion of Lafayette Place Project

Total Revenues for 22 year Period

(a)	Garage (Yrs 3-22)	$36,000,000
(b)	Hotel (Yrs 5-22)	7,200,000
(c)	Retail (Yrs 5-22)	10,800,000
	Total Revenue	$54,000,000

Total Debt Service for 22 Year Period

(1)	Acquisition & Demolition (Yrs 1-20)	$ 6,357,600
(2)	Construction of Garages and Improvements (Yrs 2-21)	23,487,800
(3)	Construction of Public Improvements (Yrs 3-22)	6,357,600
	Total Debt Service	$36,203,000

Total Net Income	$17,797,000
Average Net Income Over 22 Yr. Period	$ 808,954

Part II.C AESTHETIC ENVIRONMENT

1. General Aesthetic Character

a. Description of Existing Conditions

The Lafayette Place project area, as noted in previous sections, is located on the southern edge of the retail core of the Central Business District. The spine of the retail core is Washington Street; and Lafayette Place will be the continuation of an overall upgrading and redevelopment of Washington Street, which is steadily expanding southward.

Historically, Washington Street has always served as a major spine for Boston. Since the inception of the City, the Washington Street throughfare connected the Boston peninsula via the "neck of Boston" to Roxbury. Development along Washington Street reflected the prevailing and most ambitious commercial buildings of any historical period. The Old Corner Bookstore building, for example, at the corner of Washington and School Streets, is an example of the development typical in the early eighteenth century. The Boston Fire of 1872 destroyed much of the existant brick architecture and a new period of commercial building commenced. These buildings dominate Washington Street and its environs today, and are typical of late nineteenth-early twentieth century American commercial architecture. They vary from four to fifteen floors in height, built to the street lines with light wells or service alleys at mid-block, and are of steel or concrete frame construction usually clad with stone or terra-cotta.

The prestige of the buildings is usually expressed by the elaboration of facade detailing which employed an ecletic array of motifs but were dominated by neo-classical detailing. In general, however, these buildings are more notable in relating together to form a late 19th century commercial streetscape. Unfortunately, most of these structures have had major alterations at street level. The ground floors are generally commercial with direct access to the street and the upper floors are offices. To the south and east of the project site, many of these structures are large mercantile or loft buildings housing manufacturing or wholesale activities.

The project area is, in general, surrounded by such buildings. There are, however, some unique structures and noteworthy elements of the City landscape in the immediate vicinity. Buildings of historical and architectural merit are identified in Section C.2 below. Of special interest is the group of theatre buildings immediately opposite the project area on Washington Street which include the Paramount and Savoy Theatres. Both these theatres and associated buildings are under consideration for designation as a National Register District. Also, considerable development and entrepreneurial interest is being shown in revitalizing the district as a whole and the individual theatres in particular back to a legitimate theatre district.

The spatial form of the urban environment in this section of the City is coherent and without special features - structures built to the street lines which in turn are a function of a distorted grid-iron network. The only exception to this pattern is the Hayward Place mechanical parking garage, a more modern structure which is completely unsympathetic to the existing structure of the City.

There are no noteworthy vistas or views in the area with the possible exception of the view up West Street which terminates at the Boston Common fountain, which in turn is the focus of a radial network of paths through the Common.

b. Impact of the Proposed Project

In discussing the impact a development proposal will have on the character of a city, a largely subjective set of standards has to be employed. The most important question is whether the project will reinforce or compete with the existing environment.

The proposed project essentially consists of two formal elements, the podium which contains the retail component of the development and the tower which is the hotel component. The podium element conforms to existing street lines, is generally in scale with the surrounding buildings (the podium averages a height of three to four floors), and will be clad in masonry. The tower, on the other hand, is obviously an entirely contrasting element in comparison to the older City; it is, however, set as far back as possible from the sensitive Washington Street facade. This set-back also places it in closer proximity to the cluster of towers associated with lower Summer Street (e.g., 100 Summer Street, 99 High Street).

A series of buildings, the former Jordan Marsh Annex between Bedford and Avon Streets, is to be demolished in order to implement the project. These buildings are not outstanding and although their loss may be regrettable to some, it is essential both architecturally and functionally, that the proposed project physically abuts the new Jordan Marsh store between Summer and Avon Streets. Otherwise, all existing buildings, both of architectural and historic merit and the more mundane, are respected by the proposed project.

Although the Hayward Place garage is being retained as a parking facility for the Lafayette Place development, its retention currently is considered a temporary measure. With the expected success of the Lafayette Place, the retail component could be expanded to the Hayward Place garage site in the future, thus further reinforcing lower Washington Street (see also Part IV).

The vista along West Street is acknowledged by a penetraion in the design of the Washington Street facade with its intersection with the axis of West Street.

In summary, the filling in of the vacant land in this part of Washington Street by a physical structure which conforms in scale and materials to the existing peripheral structures can both reinforce the existing environment and complement the organization of downtown Boston as it has traditionally evolved. The proposed redevelopment thus can provide the opportunity for a positive impact on the general aesthetic qualities of the area and the visual experiences of people within and around the project area. The architecture and design of the new buildings will be subject to design review by the Boston Redevelopment Authority prior to commencement of construction. This review will be made to assure compliance with the specific controls set forth in the Bedford-West Urban Renewal Plan as well as to evaluate the quality and appropriateness of the development proposals with reference to the design objectives and requirements of the Authority.

The general design objectives for the Lafayette Place project recognize the urban significance and built-up character of the Central Business District and encourage the enhancement of this character through the development of a multi-stories, mixed use complex. The proposed buildings should be visually and architecturally compatible with the existing development in the surrounding area and thus would preserve the urban nature of the City's downtown district. The design objectives also emphasize the preservation and extension of pedestrian amenities in downtown Boston by encouraging the creation of pedestrian areas and of active and pleasant pedestrian circulation patterns within the complex and adjacent areas. These objectives likewise are met by the extensive open space and pedestrian circulation system which are proposed in the development plans.

Part II.C. AESTHETIC ENVIRONMENT

2. Historical and Archaeological Resources

a. Description of Existing Conditions

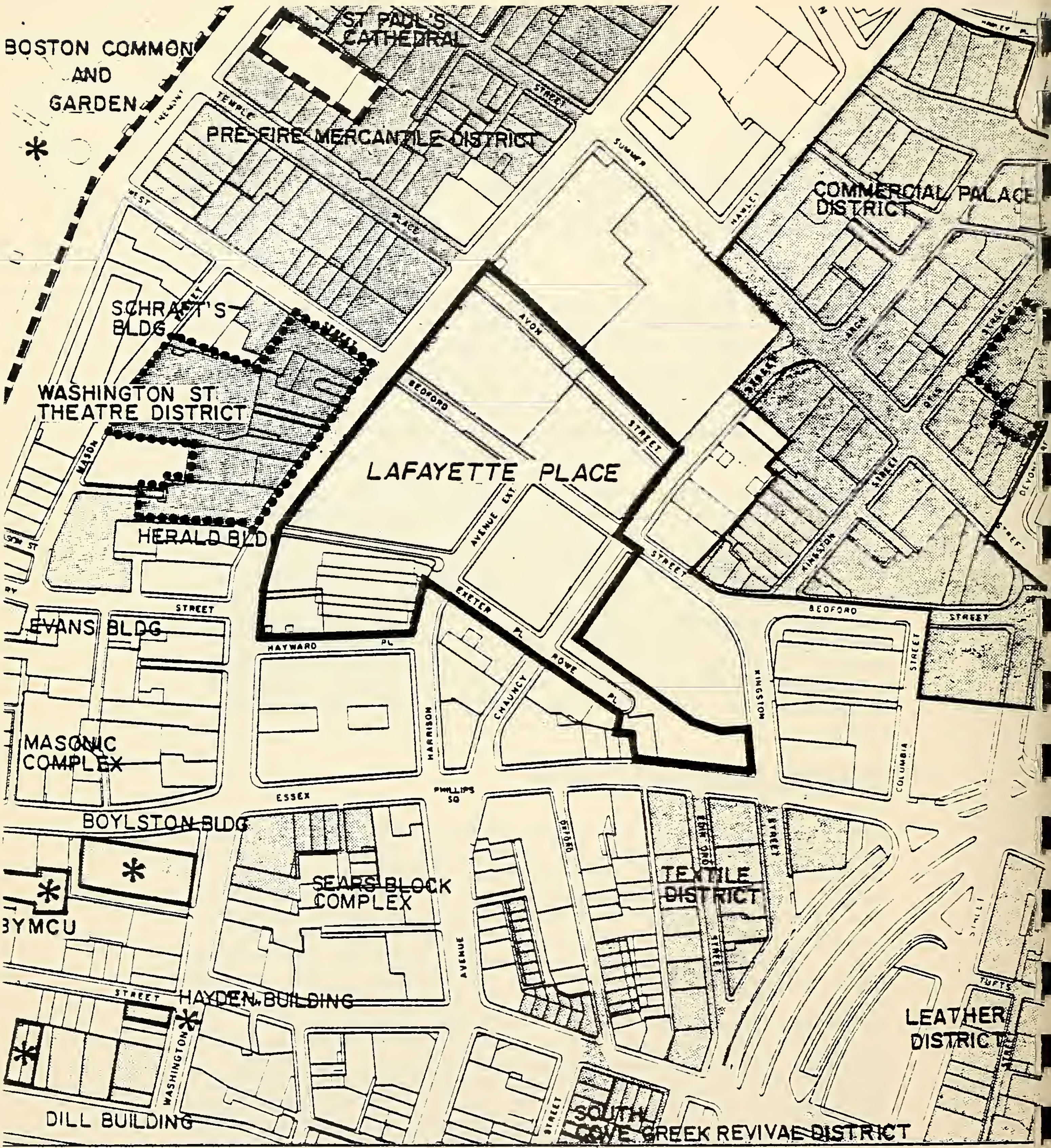
Historic Properties

The Lafayette Place project area contains only one block of buildings - a group of 9 vacant late nineteenth and early twentieth century commercial buildings which formerly housed the Jordan Marsh Annex. Built of masonry, ranging in height from 4 to 10 stories, and varying in massivness, the condition of these nine structures has deteriorated considerably over the years. In the opinion of the Boston Landmarks Commission, none of these buildings would qualify for listing on the National Register of Historic Places.

Adjacent to the project area are two districts which exhibit architectural and historical significance and are considered to meet the criteria for National Register listing (Figure II.C.1). Opposite the project site, at 525-563 Washington Street, is the Washington Street Theatre District, dating from 1876 to 1932. This district was voted eligible for National Register listing by the Massachusetts Historical Commission on December 13, 1977. The second district, the Commercial Palace District of 1873-ca. 1877 commercial architecture, is located to the northeast of the Lafayette Place project area and was voted eligible by the Boston Landmarks Commission on December 14, 1976. Brief description of these two districts follow.

(a) Washington Street Theatre District
(525-563 Washington Street)

In this short stretch of Washington Street a major chapter in the history of Boston's theaters was written; and although many of the original structures have vanished, much remains and even the recent can still evoke the memories of an exceptionally rich past. The Adams House Annex at 543-47 occupies the stie of the first theater in the district - the Lion - converted in 1836 from the tavern of that name into an arena housing equestrian performances. Other theaters followed on that site; the Melodeon (1839), the New Melodian (1859), the Gaiety (1878), the Bijou (1839), and behind the Adams House Annex, B. F. Keith's New Theater in 1894. It was on this site that this famous entrepreneur founded his empire, developed the idea of the continuous performance, and showed Boston's first movies. The earliest interior specifically designed for cinema is the Modern Theater at 525-27. The two lower floors of an 1876 commercial building were converted into a movie theater by C.H. Blackall in 1913; his choice of the restrained Adamesque mode for the interior decor reveals the influence of the early cinema architect Thomas W. Lamb and is representative of many theaters built during the infancy of cinema. The sumptuous "Cathedrals of cinema" that were being constructed by the late '20's is excellently exemplified by the Keith Memorial Theater of



NATIONAL REGISTER AND BOSTON LANDMARKS COMMISSION STATUS

- ▬ ▬ LISTED ON NATIONAL REGISTER
- ●●●● VOTED ELIGIBLE FOR NATIONAL REGISTER BY MASSACHUSETTS HISTORICAL COMMISSION
- ▭ VOTED ELIGIBLE FOR NATIONAL REGISTER BY BOSTON LANDMARKS COMMISSION
- ▨ ARCHITECTURAL/HISTORICAL MERIT - APPEAR TO MEET NATIONAL REGISTER ELIGIBILITY REQUIREMENTS
- * DESIGNATED BOSTON LANDMARKS COMMISSION LANDMARK

0 200 400 FEET

N

LAFAYETTE PLACE

HISTORIC AND ARCHITECTURALLY SIGNIFICANT PROPERTIES
Figure II.C.1
BOSTON REDEVELOPMENT AUTHORITY

1928; its narrow facade and vast interior space reflect its predecessor of 1854, the Boston Theater - the largest in New England when it was built. The final chapter in the district's record of cinema architectural history is the Paramount, constructed in 1932 just after the introduction of sound. Occupying the site of the second Adams House of 1883, it is a good example of the "cinema moderne" style then popular.

(b) Commercial Palace District (the area extending generally from Hawley Place and Franklin Street to Essex Street and from Hawley and Chauncy Streets to Devonshire Street and Church Green)

This district contains a significant number of the commercial structures built immediately after the disastrous fire of November 9-10, 1872, which destroyed 776 buildings over a 65 acre area. By January, 1874, the Mayor's annual report was able to note that most of the burnt-over area had been rebuilt, a heroic achievement in view of the depressed economic conditions then prevailing. In many cases the post-fire buildings, described in contemporary newspaper accounts as "the new palaces of Boston merchants," represent a significant departure from the severe homogeneity of the granite-style commercial structures they replaced. Typifying the stylistic pluralism of the later 19th century, the district displays a variety of modes: Italian Renaissance (Beebe-Weld Block), Ruskinian Gothic (Bedford Building; 90-101 Arch St.) Neo-Grec (62-64, 66-72, 74-78, 83-87 Summer St.), Panel Brick (26-38 Summer St., 89-93 Franklin St). The district also contains representative works by most of Boston's prominent late-19th century architects: Jonathan Preston (Church Green Building), Cummings and Sears (72-74 Franklin St., Bedford Building), Peabody and Stern (Boston Post Building, 93-101 Arch St.) N. J. Bradlee and W. T. Winslow (64-70, 89-93, 53-57 Franklin), Gridley J. F. Bryant (Transcript Building), William Ralph Emerson and Carl Fehmer (Beebe Weld Block). Primarily housing the City's dry goods and publishing industries, these buildings incorporated a number of technological and structural innovations intended to make them more fire-resistant.

Two other districts of architectural and historical merit, which, in the opinion of the Boston Landmarks Commission staff, appear to meet National Register eligibility requirements, are located adjacent to the Lafayette Place project area - the Pre-Fire Mercantile District and the Textile District.

The Pre-Fire Mercantile District generally encompasses the area bounded by Washington, West, Tremont and Bromfield Streets and the one-block cross streets running on a north-south axis forming a ladder pattern. Although heterogenous in building age, heights, materials, and styles, the district is homogeneous in terms of commercial uses, density, setbacks from street and architectural character. Originally a high-class residential precinct, this district gave way to commercial and mercantile uses in the 1850's and 1860's. Structures housing the new uses generally were four or five story masonry buildings of heavy timber construction with brick, stone, or granite facades and regularly spaced upper story windows often heavily decorated. Styles popularly used were commercial versions of Italianate and Mansard. In 1872 this district was spared the devasting effects of the Great Fire which destroyed the rest of the commercial downtown. Building replacement in this district did not occur until the turn of the century. Then larger, elevator office structures, seven to ten stories high with masonry or tile clad facades on steel frames were built, most often at the corners or along Washington and Tremont Streets. Since then, there have been considerable alterations to the ground and second floor store fronts and to the roof lines of much of the building stock, regardless of date and style. Nonetheless, the district continues to display its pre-fire mercantile character.

The Textile District, a triangular-shaped area bounded by the Surface Artery, Essex Street, Ping On Street, and Beach Street, is a commercial district made up of loft structures built originally for light manufacturing, jobbing, storage, and offices for merchants associated with the textile and garment trade. Construction dates range form 1888 to 1920. Generally, 5-6 stories in height with flat roofs and set directly on the sidewalk, the buildings are all masonry, predominantly brick, with regular fenestration patterns.

The closest properties which are listed on the National Register include St. Paul's Cathedral on Tremont Street, 1820 (600 feet distant), Park Street Church at Park and Tremont Streets, 1809 (800 feet distant), and the Boston Common, on Tremont Street, 1634 (600 feet distant).

Archaeological Resources

According to the Massachusetts State Archaeologist, the possibility does exist that the remains of an ancient Indian culture might be encountered in the project area, similar in nature to an ancient Indian fish weir which was discovered in the 1940's beneath Boylston Street between Berkeley and Clarendon Streets. This fish weir was found at a depth of approximately 30 feet and was dated ca. 5000 B.C. The State Archaeologist has indicated that similar remains could be found at the depth of the upper and lower peat layers in the Boston Peninsula (see Appendix S).

b. Impact of the Proposed Project

Historic Properties

In accordance with Section 106 of the National Historic Preservation Act of 1966, and implementing procedures of the Advisory Council on Historic Preservation, the proposed Lafayette Place project was reviewed with the Massachusetts State Historic Preservation Officer. Following consultation, it was determined that the project would have no adverse effect on the adjacent eligible National Register properties pending review of final plans of the Washington Street facade and of other elements of the project which could affect adjacent historical properties (see Appendix I). The project was also reviewed with the Boston Landmarks Commission staff, who have concluded that the development would have an effect, though not necessarily adverse, on the two eligible districts (Appendix U).

In general, the overall impact of the Lafayette Place project on adjacent historic properties is anticipated to be positive. Some short-term adverse impacts would occur during the construction phase, but would be mitigated with the conclusion of that phase. Shadow effects from the project could be considered to have an adverse nature on the richly-detailed facades of the Washington Street Theatre grouping; however, the height of the retail center will be much lower than the building which previously occupied the site, thus reducing the potential effect. Long-term effects of a non-physical nature should be beneficial. By revitalizing and improving market conditions in the area, the Lafayette Place project should increase the likelihood that the neighboring structures would be rehabilitated and preserved.

Archaeological Resources

Since the project area is a long disturbed and built-up urban area, the existing natural land has been much altered by man, and minimal excavation is planned in the original peat area, there would appear to be little likelihood that any potential archaeological resources would be affected by the project. The State Archaeologist does not believe an archaeological survey would be feasible, but has suggested the retention of an archaeologist should any excavation reach the depth of the upper or lower peat (Appendix S).

PART III ALTERNATIVES TO THE PROPOSED PROJECT

Part III ALTERNATIVES TO THE PROPOSED PROJECT

The primary purpose of the Lafayette Place development, as described in the previous sections of this statement is to take advantage of a unique opportunity to continue and expand the revitalization of the retail core of Boston and to strengthen its roles as the central business district of the entire metropolitan area. Therefore, the consideration of alternatives in this section is based upon the ability of the various alternatives to contribute to the achievement of this goal in a realistic manner. As noted previously, the proposed project is the result of an extensive and continuing effort by the Boston Redevelopment Authority and the project's developer to develop a feasible concept, during which process a number of alternative proposals were examined and evaluated.

A. Alternative Sites

No alternative sites were considered for this project, as there do not exist within the central area any other vacant areas of sufficient size to accommodate a project of this scale. While other sites might have been examined, such as sections of the downtown considered "soft" for development - areas of high vacancies, low valuation, and deteriorated buildings, - this option would have required relocation of present site occupants and extensive demolition of existing buildings. In addition, the difficulty for a developer to assemble a suitable parcel of land from a large number of property owners probably would make the implementation of this alternative infeasible without the use of eminent domain powers. Different, smaller sites in the downtown area, however, are being explored independently by others for uses which are components of the Lafayette Place project, such as the hotel, retail uses, and a convention center. The proposed development program, with its scale and mixture of uses, is based on the special qualities of the present site and its location relative to the retail core of the City.

B. Alternative Uses

Alternative uses for the site that may be reasonably considered are those uses allowed under the City of Boston Zoning Code. The present zoning of the site is for general business and office use. The site is situated in the heart of the Central Business District, and the General Plan for the City calls for a continuation of commercial use on the site. An alternative use, therefore, would not be in conformity with the General Plan, nor with the Bedford-West Urban Renewal Plan, which governs a significant portion of the project site. A different use would represent a major alteration of the renewal plan and would be contrary to the area's historic use for business and mercantile purpose.

A second and overriding consideration for the use of this site is the value of the property. The 147,000 square feet for the retail/hotel complex is valued at $6,200,000 or approximately $42 per square foot. Were the City not to participate in this project through land acquisitions it would cost a developer an estimated

$500,000 per year to borrow the funds necessary to purchase the site. This amount, when added to estimated property taxes on the land of $1,568,100 (@$252.92 per $1,000 valuation assuming no Chapter 121A agreements), would result in a total annual carrying cost of $2,068,100 for the land alone. Therefore, any privately developed project proposed for this site must generate an additional $2,068,100 per year over and above that required to support the building or buildings, in order to support the carrying cost of the land.

Residential

Although residential use is allowed in a Business Zone, and a number of downtown buildings have been built for or converted into housing in recent years, the site has several disadvantages which, for planning considerations, would make it questionable for residential development, particularly for a luxury-type development which the land and other costs would require. The site is located in a densely developed commercial area of retail stores, offices, and entertainment uses serving the metropolitan Boston area. It borders on a major commercial street which carries an average daily traffic in excess of 9,000 vehicles, (which, however, would be reduced considerably under the TTIP plan). In addition, there are no residentially-related community facilities or amenities in the immediate vicinity which would provide for a satisfactory residential environment. Most importantly, because of the high cost of the land and development, it is extremely doubtful that the luxury housing that would be required would be either marketable or financially feasible at this location.

Institutional

A tax-exempt institutional use of the site, although it may be considered compatible with the character of the surrounding area, would be fiscally undesirable from the City's point of view. Currently, over 50% of the City's taxable property is in tax-exempt institutional or public use. Development of this high-value downtown property for a tax-exempt institutional use, therefore, is both inappropriate and contrary to the expressed policy on institutional development of the Mayor. It is estimated that the proposed development would provide approximately $2,800,000 annually to the City in the form of real estate taxes (in-lieu payments pursuant to Chapter 121A) and garage revenues.

Open Space

Similarly, use of the site for open space would be economically unjustified. Both the extremely high costs of acquiring and developing the site for open space or park purposes and the decision by the City to forego the opportunity for collecting approximately $2.8 million in revenues annually make it unfeasible that this large area be devoted to such economically unproductive land use. This is particularly true in view of the ever increasing costs of City operation and the fact that Boston's revenue structure is limited to the taxation of property. Moreover, there does not exist a need for a large open space or park in this location, since the 48-acre Boston Common is situated but one block from the project area. It should be noted, however, that as part of the proposed project a 29,000 square foot public plaza will be provided in the center of the retail complex and additional open space is planned beside the Hayward Place garage.

C. Alternative Development Proposals

In view of the above discussion, it has been concluded that development of the project site for commercial use represents the highest use of the property and the most feasible option. Accordingly the alternatives which will be considered include the following:

A No-Build Alternative, in which no new development would occur and the present use of the project site would continue.

A Build Alternative of a much larger scale - this is the original proposal which considered a project covering twice the area and over double the scale of the present project.

A Build Alternative of alternative uses - this alternative proposed the substitution of a family-oriented entertainment center for a major department store component.

A Build Alternative of a smaller scale - a reduction in the scale of the project beyond that presently proposed.

1. No-Build Alternative

The "no-build" alternative assumes that no development would occur on the project site and that there would be a continuation of the low-density parking uses on the site. It is also assumed that the Jordan Marsh Annex buildings would be demolished because of their detrimental and unsafe conditions (their demolition in any case had been scheduled independently of any decision on the Lafayette Place development) and that another open parking lot would be constructed on the cleared site as a temporary use. If this occurred, an additional 160 spaces could be provided within the project area. In addition, the City would not make any improvements beyond normal maintenance to the Hayward Place mechanical garage.

While rehabilitation of the Annex buildings might be considered an option the present condition of the buildings, their functional obsolescence and inefficient interior layout lacking adaptability to modern commercial requirements (which was a principal reason for their abandonment by Jordan Marsh), inadequate loading facilities, and the fact that the block consists of eight separate buildings of various sizes and floor heights would require costs that would make restoration of the buildings to code standards and conversion of them to contemporary commercial use economically infeasible. The appraisal report on these buildings also recommended their demolition.

The principal environmental benefits of a "no-build" project, as compared to the proposed development of the site, would be the elimination of construction period impacts, including increased particulate levels and other air pollutant levels and higher noise levels resulting from the excavation and construction activities and equipment. Potential additional pollution of surface runoff would be considerably reduced if not entirely removed and, except for the demolition of the Annex buildings, pedestrian and vehicular circulation would not be disrupted.

In a like manner, a no-project option would eliminate any potential adverse impacts resulting from the development. Somewhat lesser air quality and traffic impacts would result, although vehicular generation from the project area would more nearly approach that anticipated from development of the site if the Jordan Marsh Annex property were converted into a parking lot. Since the overall number of parking spaces in the immediate vicinity would remain the same under a "no-build" alternative as with the proposed development, the general air quality in the area would not change. On the micro-scale, however, there could be some improvement in carbon monoxide levels with the "no-build" option since the openess of the area would tend to disperse pollutants more readily than an enclosed garage and the parking itself would not be as concentrated in one location.

Without development, there would be no impact on the existing utility systems or increased potential for adding pollutants to the Harbor. Energy resources also would not be required, and thus there would be no reduction of gas, oil or other fuels.

There would also be a reduced potential for traffic conflicts in the vicinity of the site, particularly at peak hours. Under the "no build" option, Bedford Street would remain open and would continue to serve (under the TTIP proposal) as a major east-west connection between Dewey Square and Tremont Street. However, if the Annex site parking lot were to have an entrance/exit from Bedford Street (which would seem likely), some congestion could result due to queuing and vehicles entering the traffic flow.

Lastly, without a Lafayette Place development, the potential adverse impacts on the adjacent Chinese community, previously identified, would be unlikely to occur, particularly increased traffic in the Chinatown area and development pressures leading to increased property values.

The adverse impacts of a "no build" project, on the other hand, would be considerably more significant in the long-term, and can be summarized as follows:

(1) Continued underutilization, for surface parking purposes, if a large area of centrally located downtown real estate, which is far from the most productive and "highest" use of this property. Based on recent downtown real estate appraisals, it is estimated that the project site land value is approximately $8.6 million.

In addition, the Boston Zoning Code allows a FAR of 10 for this area. The continued use of the property as open parking, therefore, would be extremely detremental to both the City and the retail core as a whole.

(2) Restriction of the economic revitalization of the lower section of the Central Business District. If no development were forthcoming on the Lafayette Place parcel, the redevelopment and upgrading of the lower Washington Street area, which was initiated by the Jordan Marsh consolidation, would probably be halted for the near-term future. At the same time, a "no project" situation could threaten the sizeable private (and public) investment already committed to the downtown in the past ten years, and serious adverse impacts on the downtown business community could result.

(3) Continuation of blighting influences on adjacent properties. The unattractiveness of the existing vacant buildings and open parking lots contribute in part to the blighting of the neighboring area, and to the deterioration of lower Washington Street in particular. Without the redevelopment of this area, these adverse effects could be expected to continue, due to a lack of confidence in the area and the uncertainty of the property owners and tenants to the area's future. This, in turn, would lead to a perpetuation of the relatively high vacancy rates in the area, the unproductive use of the properties for low-grade commercial use, and minimal upkeep and maintenance of the buildings.

(4) Continuation of the adverse influences of the adjacent adult entertainment district. One of the intended objectives of the Lafayette Place project is the improvement in the physical appearance of the area with the introduction of a modern and attractive retail/hotel complex. The project would be expected to generate the infusion of several thousand consumers and employees into this section of the downtown, thereby creating a more positive development and investment attitude toward the immediate "Combat Zone" area. If the proposed project did not occur, the existing detrimental effects of the "Combat Zone" on private redevelopment in this section of the retail core would not be arrested, resulting in an increased investment apprehension in the area and continued physical deterioration of the surrounding properties.

(5) Preclusion of the retail core-Back Bay linkage. The vacant Annex buildings and large open lots presently create an unattractive "hole" at the southern edge of the retail core. It has been a long-range planning goal of the City to link the downtown retail core, through the theatre district and the future Park Plaza redevelopment project, with the Back Bay retail center along Boylston and Newbury Streets to the Prudential Center. Lafayette Place is recognized as a key element in this link. The continuation of the present land uses on the Lafayette Place site, therefore, could effectively prevent the achievement of this goal.

(6) Loss of City revenues and job opportunities. A no-action alternative could result in serious economic losses to the City, in terms of potential tax revenues, employment opportunities, retail and hotel room sales, and inhibition of further private investment in the area. With implementation of the Lafayette Place project, a net increase in City revenues of some $2,800,000 from real estate tax payments, and parking revenues, can be anticipated; these funds would be lost to the City were the property to remain in its present condition and use.

Additional revenues in the form of sales, hotel, and meal taxes also would be lost. Moreover, the estimated 1,467 short-term (construction) jobs and 1,141 permanent jobs would not be available under a "no-build" option. Finally, the potentialy negative investment attitude in the downtown that could result were the project not implemented could cause an undesirable reduction of the economic revitalization of the retail core, resulting in further revenue and employment losses to the City. Based on the experience of the Prudential Center and Government Center projects, it is estimated that property values in the immediate area of the Lafayette Place development could increase by as much as 30%. These increased property values, and the overall economic vitality generated by the new development, could stimulate an estimated $50 million of new investment within the surrounding area in new construction and rehabilitation of existing facilities. This upgrading would generate further increase in sales, employment, income, and tax revenues to the City.

(7) Abandonment of the Urban Renewal Plan. Lastly, no project would mean the abandonment of the approved Urban Renewal Plan for the Bedford-West Urban Renewal Area, which forms a part of the total project area; and the sacrifice of some $1.2 million in Federal urban renewal funds that have already been committed to this project. In addition, not carrying the project forward would mean the loss of a sizeable investment of time and money - both public and private - already spent in planning, administration, and designing and for architectural and consultant services.

2. Development Proposal of a Larger Size

The original proposal for the Lafayette Place development submitted to the Boston Redevelopment Authority in 1975 conceived of a much larger and more intensely developed project occupying some 12 acres of land and proposing the development of over 4,000,000 square feet of space. The total project, developed by the Sefrius Corporation in a joint venture with the Jordan Marsh Company, included a Lafayette Place retail/hotel/office complex of some 2.5 million square feet, the consolidation of the Jordan Marsh retail facilities into a new and remodeled facility, and the construction by the City of a 1,500-2,000 car parking garage, a new east-west arterial street, and related circulation and site improvements. (See Figure III.1.)

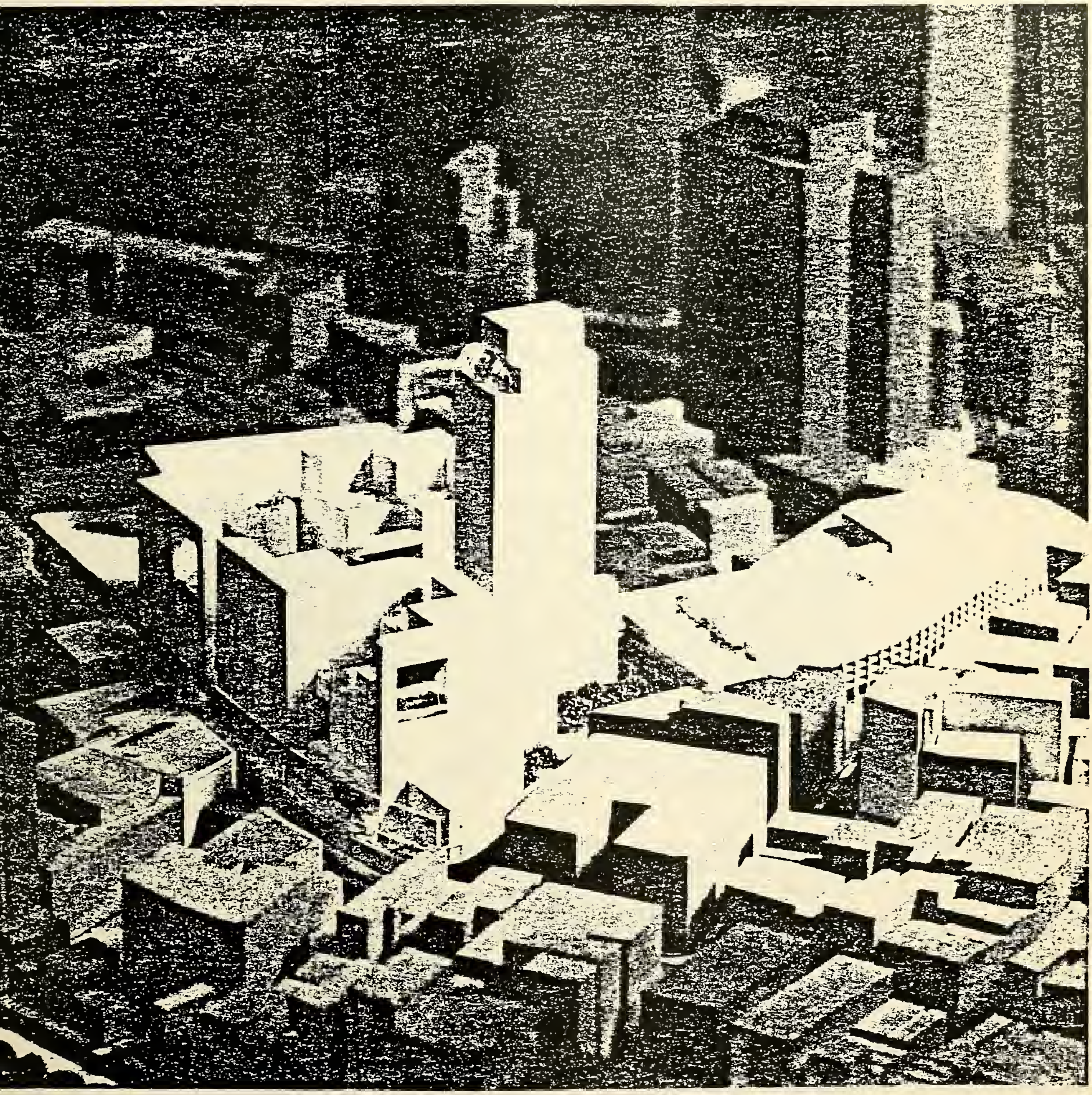


Figure III.1: VIEW OF MODEL OF ORIGINAL PROPOSAL FOR THE LAFAYETTE PLACE DEVELOPMENT PROJECT

Total cost of this project was estimated at $210 million. Designers of Lafayette Place were I.M. Pei and Partners and Cossutta & Ponte, while Jordan Marsh retained Sumner Schein as architect for their new structure. Since the proposal required the cooperation of the City government to implement the public portions, an agreement was adopted by the Boston City Council and was approved by the Mayor in 1975. In addition, since the project area included the Bedford-West Urban Renewal Area, the Boston Redevelopment Authority tentatively designated the Sefrius Corporation as redeveloper of the renewal parcel the same year. Subsequently, the developer was unable to obtain firm financing for the project and the proposal was postponed. Pending financial commitments by the developer, the City did not proceed on its portion of the project. Jordan Marsh, however, did complete its consolidation program independently in 1977.

The major components of the original Lafayette Place/Jordan Marsh proposal included the following elements:

(1) Reconstruction and consolidation of the Jordan Marsh downtown department store from three separate buildings into new and renovated facilities at their Summer-Washington Streets block. Although the amount of space was to be reduced by some 900,000 square feet (to approximately 800,000 square feet), the consolidated store would be more efficient in operation and selling areas would occupy a larger proportion of usable floor space. The program included the demolition of the Old Main and Shuman Buildings on Washington Street for the construction of the new facility and later demolition of the Bristol Block and the Annex following their vacation. (With the exception of the demolition of the Annex buildings, all components of this program have been completed by Jordan Marsh.)

(2) Lafayette Place retail components consisting of 450,000 square feet of space on three levels anchored by a new 160,000 square foot major department store at the south end of the site and linked directly with Jordan Marsh on the north. Organized around an internal pedestrian mall, the retail center included large and small stores and service establishments, specialty shops and boutiques, and cafes, restaurants, and theatres.

(3) A 750-room hotel, built along Chauncy Street on top of the retail center, with major convention facilities and a 410 foot tower of hotel rooms. The hotel was directly linked by a pedestrian bridge to the garage on the east side of Chauncy Street, where also were located the hotel's convention facilities.

(4) Three to four medium-size (200 feet) office buildings, to be developed over a period of time in accordance with demand. Approximately 1,200,000 square feet of space was proposed for office development. The separate buildings were to be built above the retail center, each with its own identity and an independant lobby at street level.

(5) A 1,500-2,000 space parking garage on the east side of Chauncy Street, partially built on air-rights over an existing Boston Edison substation. Retail uses were proposed on the ground floor along Bedford and Essex Streets, and the hotel lobby and pick-up/drop-off area along Chauncy Street. To accommodate the garage, three existing City-owned garages in the vicinity would be demolished.

(6) Construction of a new east-west arterial street (New Essex Street) at the southern boundary of the project area to improve traffic flow and provide access to and from the Lafayette Place project. This street, extending from the Surface Artery to Washington Street, was connected to Avery Street for westbound traffic to continue to Tremont Street.

(7) Related project and circulation improvements including the widening of Chauncy and Kingston Streets, sidewalk improvements, and construction of a Washington Street mall with one lane of traffic between wide sidewalks, beginning at New Essex Street. Within the Lafayette Place project itself, a three-level pedestrian concourse was proposed running through the project and the Jordan Marsh store and connecting directly to the Washington and Essex subway stations. Another covered pedestrian passageway crossed through the project at Bedford Street. Related MBTA station improvements were also proposed. In addition, service functions including service to Jordan Marsh, were entirely accommodated at the sub-basement level with a ramp leading off Chauncy Street; allowing Jordan's to abandon their existing loading docks on Chauncy Street.

Although the general concept was similar to the present Lafayette Place proposal, and the majority of the elements have been retained, it is obvious that the 1974 plan differed in several respects:

(1) The 1975 project encompassed twice the land area (12 acres vs. 6 acres) as the present proposal.

(2) The total development of some 4 million square feet of space was four times that of the present project (approximately three times greater if the Jordan Marsh consolidation is excluded).

(3) Over twice the retail space (610,000 sq. ft. vs. 300,000 sq. ft.) was proposed and 250 additional hotel rooms were planned. Up to 500 additional parking spaces also were proposed.

(4) The original proposal included, in addition, over one million square feet of office space and a major department store. While these uses are in complete conformity with downtown development plans and the existing character of the area, the resulting FAR of 12 would have been incompatible with the present Zoning Code, which specifies a maximum FAR of 10 for the project area.

(5) The total cost of the project ($210 million) was three times the estimated cost of the present proposal ($71.8 million).

(6) Implementation of the 1975 plan would have required the acquisition of four occupied structures and the relocation of approximately 125 tenants, representing 625 jobs, in order to construct the parking garage and New Essex Street. Three existing City garages also would be demolished (but their spaces would have been replaced by the new garage).

With respect to the environmental impacts of this alternative, in comparision with the Lafayette Place project as recently proposed, the impacts - both adverse and beneficial - would, in general, be basically the same, differing primarily in their magnitude and importance due to the greatly increased scale of the project.

In summary, the major potential adverse impacts of the larger scale development proposal, in relation to the present scheme, would include the following:

(1) In the short-term, construction-related impacts would be significantly greater, since a development project three times as large (excluding the Jordan Marsh consolidation) was proposed. This project therefore would result in corresponding increases in the generation of air pollutants, especially particulates, noise levels, and construction traffic impacts. An estimated 88,650 cubic yards of excavation material would have been generated, which would have required proper disposition. The larger-scale proposal also would have necessitated the demolition of nine additional commercial buildings (including the Bristol Block, subsequently demolished by Jordan Marsh) and three parking garages, totalling some 1,011,400 square feet in area and producing approximately 307,930 cubic yards of demolition debris. Both the added excavation and demolition would have generated an estimated 834.2 tons of particulate matter which would have been added to the existing ambient air. Moreover, the increased excavation and demolition would also add to potential water pollution problems from increased runoff which could be anticipated.

It was estimated that the original proposal would have required 7 to 8 years for completion, thus being 3 to 4 years longer in construction than the current project. This longer time period, together with the larger size and area of the project, would have resulted in greater and longer disruption to pedestrians and local vehicular traffic.

(2) As noted above, the original proposal would have required the acquisition of four occupied commercial structures and the displacement of some 125 tenants with an estimated 625 employees. Although detailed breakdowns of these firms were not available, it was estimated that they were, on the average, small operations with 3 to 4 employees and were mainly offices, wholesale distributors, and manufacturing representatives. Because of

the then-availability of "Class C" office and loft space in the downtown area, the BRA's Business Relocation Department expected to the able to relocate at least 70% of those firms in comparable space. In addition, some proportion of these businesses might have been expected to cease operation because of displacement, resulting in the loss of a certain unquantified, number of jobs.

(3) The greater scale of the original proposal would have resulted in a much more intensely developed and higher density project which, in some respects, could have been incompatible with the more moderate density of the immediately surrounding area. Although the retail complex and department store would have been limited in height to reflect neighborhing properties and the hotel tower was to be set back to Chauncy Street (both elements of the current proposal), at least two of the mid-rise office towers would have been located on the Washington Street facade and could have resulted in an adverse scale relationship with the existing environment. Furthermore, the resulting floor area ratio of 12 was in excess of that allowable by the City's zoning code (FAR of 10).

The larger mass of the project, and especially the higher elements along Washington Street also could have resulted in an adverse impact on the adjacent Washington Street Theatre District, an eligible National Register property. In particular, the project would have caused undesirable shadowing of the ornate facades of many of these highly-decorative theatre buildings.

(4) A greater burden would have been placed on the existing utility systems and increased demands for energy resources would have resulted from the larger scale project, although they were not expected to result in any overloading of the systems. It is estimated that the original proposal would have generated a daily water demand of some 1,150,000 gallons (compared to 394,765 gallons for the present proposal) and would have generated a like amount of sanitary sewage and approximately 20.70 tons of solid waste daily (as compared to the current estimate of 14.46 tons). Energy requirements, assuming steam heating and air conditioning, would have increased three to four-fold; the larger development would have required an estimated 110,500 lbs. per hour of steam and 9,500 KW of electricity supplied by Boston Edision. (Parenthetically, however, it can be noted that the lesser scale and area of the present project does not foreclose the future development of that area which is no longer within the project bounds. Consequently, some future high density development in the Boston Edison area would increase utility and energy demands in the general area, as well as traffic generation and other impacts.)

(5) Vehicular traffic impacts would have been potentially greater, as an additional 3,000 one-way trips per day would have been generated by the larger project. However, with the proposed construction of an east-west arterial street (New Essex Street), and with the garage located east of Chauncy Street, no significantly adverse circulation impacts were anticipated as a result of the project, although additional congestion was anticipated at the Tremont/Boylston Streets intersection and at the junction of Essex Street and the Central Artery. In general, however, improvements in levels of service and circulation conditions in the immediate area were expected due to the construction of New Essex Street. These conclusions were confirmed in a traffic and site analysis undertaken for the Lafayette Place proposal by Barton-Aschman Associates.[1] At the same time, the extension of New Essex Street to Avery Street would have allowed for a smoother and more direct westbound connection to Tremont Street than the present proposal does.

(6) It was also estimated that the original scheme would have required 3,000 parking spaces, which is twice the number considered necessary for the present project. The proposed parking garage would have accommodated 2,000 of these spaces, and the additional 1,000 spaces were assumed to be available from existing surplus spaces in the immediate area (estimated at 2,025 spaces with a seven-minute walk from the project area).

(7) The additional traffic generation and parking requirements would have led to corresponding impacts on air quality. Since no analysis had been made for the original proposal, and in any event carbon monoxide concentrations are highly dependant on localized factors such as traffic circulation characteristics, site configuration, the design of the garage and its circulation pattern and entrance/ exit location, no specific conclusions are possible on comparative air quality impacts of the alternative development proposal. Based on the air quality impact study prepared for the present proposal, however, it is believed that a greater degree of violation of the 8-hour CO standard, and possibly some violations of the 1-hour standard, would occur with the larger development.

(8) Lastly, a more intense development could have resulted in a greater development pressure on the adjacent Chinatown area and in a higher and more rapid increase in property values, which would have threathened the continued existance of this community in this location unless appropriate measures were taken.

---

[1] Barton-Aschman Associates, Inc., Site Analysis, Lafayette Place, Boston, Massachusetts, prepared for SEFRIUS, Developers, Washington, July 1974.

In terms of greater benefits from a larger scale, Lafayette Place project, again the positive impacts identified for the present proposal would differ primarily in degree of magnitude. The most significant beneficial impacts - those related to the removal of existing blighting and other adverse conditions, the economic revitalization of the retail core, the improvement of investment confidence, the arrest of continued deterioration in the area, and the increased potential for redevelopment and rehabilitation in the general vicinity - would have occurred equally as well with the former proposal.

Due soley to its larger size, and the inclusion of a major department store and 1.2 million square feet of office space, the original proposal would have resulted in potentially greater economic impacts (in terms of tax revenues, employment opportunities and wages, retail sales, etc.), which in turn would have meant a more significant impact on the downtown revitalization. A summary of comparative economic impacts is indicated in the following table (Table III.1).

Table III.1

Lafayette Place - Comparative Economic Benefits

Original Proposal[1] vs. Current Proposal

Factor	Original Proposal	Current Proposal
Total Project Investment	$ 210.1 million	$ 71.8 million
Private Investment	185.0 million	41.25 million
Public Investment	25.1 million	30.56 million
Employment		
Construction (total)	5,865 man years	1,467 man years
Permanent (annual)	11,440 persons	1,141 persons
Wages		
Construction (total)	$ 73 million	$ 24.2 million
Permanent (annual)	100 million	8.4 million
Retail Sales	$168 million	$ 27.0 million
Hotel Sales	$ 16 million	$ 10.6 million
Tax and Other Revenues		
Commonwealth of Massachusetts (income, sales, meals, etc.)	$13.0 million	$ 2.3 million
City of Boston	$10.4 million	$ 2.8 million
Real Estate Payments	7.1 million	1.0 million
Return from State	1.7 million	*
Parking Garage Revenue	1.6 million	1.8 million

* Return from State no longer related to State income from a particular development.

[1] Includes Jordan Marsh consolidation program.

3. Development Proposal with Alternative Use

Following his inability to obtain a major department store as a prime tenant for the retail center, the designated developer sought an alternative use as a major tenant and began negotiations with Wolf Brothers of Chicago for the development of an indoor family entertainment center to replace the originally-proposed department store. Although certain design modifications were necessary to accommodate the entertainment center, in essence the new Lafayette Place project itself was otherwise the same as the original proposal.

Jordan Marsh had initiated their consolidation program on their own in February, 1976, but the agreement with Sefrius regarding the purchase of the Bristol and Annex sites and the demolition of the Annex buildings by Sefrius remained, and the City still intended to construct a parking garage and the New Essex Street, as well as implement related public improvements. An agreement with Sefrius was signed by the Wolf Brothers in November of 1976, but the proposal was later dropped due to financial infeasibility.

Under the revised plan, the retail/hotel complex was to consist of 504,300 square feet of retail facilities on three levels containing (1) a 245,400 square foot gross leasable area retail center (2) a 57,900 square foot mall, (3) a 201,000 square foot family entertainment center, and (4) a 750 room hotel in a 30 story tower built on top of the retail center, which also would contain the hotel lobby area. The office towers were still included as part of the project.

The entertainment center was conceived as a high standard center, similar to Disneyland and Six Flags, to be completely compatible with the remainder of the project. The center was to include rides, shows, exhibits, amusement games, fast food services, vending machines, refreshment facilities, and other facilities considered appropriate for a family-oriented center.

In general, the environmental impacts of this proposal would be essentially the same as for the original Sefrius proposal (exlcuding the Jordan Marsh portion) since the scale of the revised project remained basically the same (there was, however, a reduction of approximately 100,000 square feet, or 17%, in retail space excluding the department store). The principal difference was the replacement of the proposed department store with an entertainment center, which use nonetheless would be compatible with the downtown environment and would relate to existing entertainment and theatre uses in the general area. A family-oriented center as proposed could have had the additional positive impact of encouraging the upgrading of the adjacent "Combat Zone". On the other hand, inclusion of the entertainment center in Lafayette Place could indirectly lead to a perpetuation of the uses associated with the "Combat Zone" rather than their exclusion. While no firm figures are available, the entertainment center possibly could generate a greater number of consumer to the area than a department store would have, and this in turn could result in both adverse impacts (in terms of additional traffic generation and pedestrian volumes) as well as more positive impacts (in terms of economic benefits).

4. Development Alternative of a Smaller Scale

Although the present proposal represents a considerable reduction in scale from the project as originally conceived, an even smaller scale project potentially could be considered for evaluation purposes. Such a project would involve the construction of a garage with somewhat less than 900 parking spaces, a reduction in the area of the retail facilities, and a hotel of a lesser number of rooms. Since a specific reduced-scale project has not been proposed, the impacts can be considered only in general, relative terms when compared with the current development scheme.

For the short-term construction period, the major benefits of a smaller project would consist primarily of a reduction in the construction-related impacts. Although the potential adverse impacts would, of course, not be entirely eliminated, their magnitude and duration - particularly increases in air pollutants and noise levels, the generation of solid waste and other debris, localized traffic and pedestrian disruption - would be lessened to the extent that the scale of the project were reduced. Some impacts, such as the demolition of the Jordan Marsh Annex buildings and general preparation of the site for development, would remain the same as for the proposed project. No increases in, or additional adverse impacts, however, would be expected during the construction period from a smaller scale project.

In the long-term, a reduced-sized project likewise would lessen the magnitude of potential permanent adverse impacts. Lesser traffic volumes would be generated by such a project (in direct relation to the scale of the development and number of parking spaces provided), leading to reduced potential for congestion and adverse air quality impacts. While the current proposal is not, in itself, expected to cause any traffic or circulation problems, the generation of a lesser amount of traffic would, nonetheless, help ameliorate congestion problems along certain street segments and at certain intersections expected as a result of TTIP-related traffic re-adjustments. This, is turn, would reduce the potential for violation of the 8-hour CO standard as identified in the air quality impact analysis. Depending on the extent of a scale reduction, it is possible that at specific intersections (such as the north approach to the Bedford and Kingston Streets intersection, where peak-hour project generated traffic would represent 20 percent of the total traffic volume and the 8-hour standard would be exceeded by 1 ppm), the presently-anticipated violation could be eliminated.

With a smaller development, the impacts on the existing utility systems and energy resources would be lessened, and there would be reduced addition of pollutants to the Boston Harbor from the sanitary drainage system. Similarly, the significance of development pressures and other possible negative impacts on the adjacent Chinatown area could be reduced to some extent. Most importantly, however, many of the significant beneficial impacts of the development, including the elimination of deteriorating conditions and other blighting influences, the restoration of development confidence in the project vicinity, and the improvement of the general economic condition of the downtown, could still be expected to occur even with a somewhat smaller project.

On the other hand, reducing the scale of the project significantly could seriously impact its feasibility and, in all probability, would mean that the project could not be carried forward. Because of the extremely high front-end costs for land acquisition and site preparation, and the limited amount of government subsidy available, there exists a certain level below which a development program would not be economically justifiable either for the private investors or for the City of Boston. At the same time, a smaller project would result in lesser beneficial impacts on the economy, with respect to tax revenues to the City and the Commonwealth, employment opportunities and wages, retail and hotel sales, etc., and possibly also in the economic revitalization of the downtown.

D. Alternative Proposals for the Hayward Place Garage

The Hayward Place garage, with a capacity of 700 cars, is, in fact, a very inefficient mechanical (elevator) garage which suffers from low occupancy rates and expensive operating costs. In 1976, the City's Real Property Department, which owns the garage, received only $5,000 per month from the lessee. Today, the garage is in default due to constant maintenance requirements and is not meeting its lease obligations.

Under the current Lafayette Place proposal, it was originally intended that the City would renovate completely the Hayward Place garage and convert it from a mechanical garage into a ramp garage, with a loss of 100 spaces. Total cost of the rehabilitation was estimated at $2,100,000. Subsequently, further consideration was given to the desirability of expending large amounts of public funds for the conversion of the garage, particularly in relation to the potential ultimate use of the garage parcel for more compatible and desirable commercial uses. As a result, it was recommended that the City undertake only minimal rehabilitation of the garage as a mechanical garage, at an estimated cost of $100,000, pending a decision on the future use of the parcel. While this proposal would require substantially less investment on the part of the City than the ramp-garage option, it does have the disadvantage of possibly incurring an annual operating deficit and, like the former proposal, does involve an investment for a basically obsolete type of garage with a limited useful life. Additionally, retaining the garage would essentially foreclose for some years the possibility of a more suitable development of this site.

As an alternative, some thought has been given to the demolition of the Hayward Place garage as part of the Lafayette Place project and the creation of a 95-car temporary parking lot on the site. This proposal would have the advantage of immediately making available the parcel for future development (or for an extension of the underground Lafayette Place garage, adding another 200 spaces). Demolition of the garage structure also would allow for a more satisfactory alignment of the proposed east-west arterial street for a more direct connection to Tremont Street, which would result in improved traffic circulation. Moreover, although a net of some 600 parking spaces (future) on the site would be eliminated by this option, the normal parking needs of the Lafayette Place project would still be reasonably met and peak demand could be handled by other nearby garages (including the City's Kingston/Bedford and Essex/Lincoln garages, which would not need to be closed to meet the parking freeze requirements of the Lafayette Place garage).

At the same time, this alternative would have several adverse impacts. In the short-term, the cost/revenue comparison would be negative, with an estimated loss of some $55,000 annually. Secondly, the long-term benefit of more appropriate reuse could be affected by an uncertainity regarding future redevelopment and the ability of finding a "real" project for the site. Consequently; an open parking lot could adversely affect the image of the new Lafayette Place development and could result in a continuation of the same negative impacts which the site currently exhibits.

PART IV ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED AND MEASURES TO MINIMIZE ADVERSE IMPACTS

Part IV ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED AND MEASURES TO MINIMIZE ADVERSE IMPACTS

The evaluations contained in Part II of this Statement identified and discussed the probable impacts - both positive and negative - of the proposed Lafayette Place project, in both the short-term (temporary) and long-term (permanent) time periods. This Part focuses on the adverse environmental impacts, including those which are unadvoidable, and describes the mitigation measures that are available to minimize the impacts so as not the cause of any permanent environmental damage.

A. Short-Term Impacts and Mitigation Measures

The major adverse impacts identified for this project for the short-term (construction) period include the temporary effects of increased levels of air pollution and noise, the accumulation and disposal of debris and solid waste, the effects of construction-related truck traffic on local circulation, potential harm to water quality from increased pollutants in surface runoff, disruption of pedestrian movement and increased hazards to public safety, and impacts on groundwater levels and on possible archaeological resources. All of these impacts are, essentially, unavoidable aspects of a construction-related project, particularly of the magnitude of the proposed project, and cannot be entirely eliminated except by not implementing the project. On the other hand, the fact that the project has been reduced considerably in scale from the earlier alternative development proposals has in itself mitigated the potential construction-related impacts by decreasing their magnitude.

Air Quality

To minimize the impacts of air pollition during the construction period, contract documents will require that all demolition and construction work be done in compliance with the City of Boston and Commonwealth of Massachusetts air pollution control regulations. City of Boston regulations are contained in the "Regulations for the Control of Atmospheric Pollution", adopted under the provisions of Section 31C, Chapter 111, Massachusetts General Laws, which are enforced by the City of Boston Air Pollution Control Commission. Massachusetts regulations are contained in the "Regulations as Amended for the Control of Air Pollution in the... Metropolitan Boston Air Pollution Control District...", adopted under the provisions of Section 142D, Chapter 111, of the General Laws, and enforced by the Bureau of Air Quality Control. Pertinent sections of these regulations, relating to demolition and construction activities, are attached in Appendix V. To implement these regulations, specific control measures, as described below, can be utilized.

The most significant air quality impact during the construction period would be substantial increases in the amount of particulate matter, or fugitive dust, released into the atmosphere as a result of building demolitions, loading of rubble and excavation material into trucks, land clearance, excavation, and grading, and cut-and-fill operations. During demolition, dust levels can be reduced significantly, by as much as 80%, with the use of extensive or continuous wetting (use of water spray) throughtout the demolition and rubble-removel process. Average control (intermittant wetting, with the most intense wetting occurring during the actual razing of a structure) can result in a 50% reduction of dust generation. In the Lafayette Place project, dust generation from demolition activity is expected to be minimized to some extent since much of the demolition currently is proposed to be done by hand rather than entirely by the use of cranes or steel balls (alternative demolition methods are, however, under investigation). In addition, all chutes constructed for the removal of debris should be covered, or of such a design as to fully confine the material to prevent the dissemination of dust into the air.

Fugitive dust from land clearance, grading, and excavation activities can be controlled by watering down of the exposed ground area or by chemical stabilization methods, such as the application of calcium chloride. According to EPA studies, twice daily watering with complete coverage can reduce dust emissions by up to 50%. Chemical stabilization, which is not effective in reducing dust generation caused by construction equipment traffic on exposed ground or by actual excavation and cut-and-fill operations, may be used most effectively on completed excavations or graded sites. However, chemical stabilization may be costly, contaminate the treated soil, and have adverse impacts on water quality from runoff pollution.

To control dust from trucks loaded with demolition debris or excavated material, and to reduce spillage on city streets, all trucks should be sprayed when necessary and loads should be covered with suitable tarpauling. Moreover, all trucks or other vehicles leaving the site should be hosed and washed clean of mud and dirt clinging to the wheels and exterior body surface, to prevent mud and dirt from being carried onto adjacent streets.

Air pollutants also will be emitted by gasoline- and diesel-powered construction equipment and trucks operating on the site, and fumes and vapors associated with these equipment may temporarily degrade air quality in the immediate vicinity. These emissions can be reduced by restricting the idling of trucks and equipment when not in use.

Should asbestos material be present in any of the buildings to be demolished, contract specifications will require strict compliance with EPA regulations (National Emission Standards for Hazardous Air Pollutants) published in the Federal Register, Part II, April 6, 1973, as amended, to prevent the emission of friable asbestos material.

Noise Levels

The construction program will result in an unavoidable increase in acoustic noise levels during the hours of construction because of clearing, excavation, grading, the movement of trucks and heavy equipment and the use of certain equipment, especially pile drivers. It is impossible to entirely eliminate the noise levels associated with construction. If construction takes place on a normal 40-hour week, the efficiency of local commercial activities, as well as the psychological makeup of the regular commuter or shopper in the area, could be negatively affected by noise exposures for several months. On the other hand, should the construction schedule be accelerated to include two or three shifts for six or seven days per week, the overall duration of peak noise generation would be reduced at the expense of off-peak hour noise exposure at the several residential developments in the vicinity of the project site, where construction activities would negatively impact typical sleeping hours. Minimizing the construction noise exposures at nearby residential buildings and the adjacent commercial facilities simultaneously is not possible. In addition, it is doubtful that the City would allow construction activities to take place beyond normal working hours due to the pressence of nearby residential uses.

Noise levels from construction operations are, like the emission of air pollutants, similarly regulated by City and State regulations, compliance with which will be required in construction contracts. On the municipal level, excessive noise generation is governed by the "Regulations for the Control of Noise in the City of Boston", adopted under authority granted in Chapter 40, Section 21, of the Massachusetts General Laws, which regulations also are enforced by the Boston Air Pollution Control Commission. Massachusetts regulations are contained in the aforementioned air pollution control regulations. (For applicable sections of these regulations, see Appendix V.)

Noise levels of demolition and construction equipment can be reduced considerably by the use of commercially-available muffled equipment and by the installation of mufflers and housing on existing equipment. EPA studies have indicated possible reductions of from 1 to 18 dB(A), depending on the piece of equipment and the type of control used (see Tables IV.1 and IV.2). Other studies indicate even further reductions are possible by using state-of-the-art abatement equipment, including a significant reduction in noise emitted by pile drivers, one of the loudest pieces of construction equipment which will be used on the site (see Table IV.3).

Other mitigation measures that can be employed to reduce excessive noise generation from construction activities include: (1) selecting the quietest of alternative items of equipment (e.g., hydraulic tools instead of pneumatic impact tools), (2) replacing individual operations and techniques by less noisy ones (e.g., using welding rather than riveting), (3) turning off idling equipment, and (4) scheduling equipment operations to keep average noise levels low, to keep noise levels relatively uniform in time, and to have the noisiest operations coincide with times of highest ambient levels.

Table IV.1: IMMEDIATE ABATEMENT POTENTIAL OF CONSTRUCTION EQUIPMENT[1]

Equipment	Noise Level in dB(A) at 50 ft: Present	Noise Level in dB(A) at 50 ft: With Feasible Noise Control[1]	Important Noise Sources[2]	Usage[3]
Earthmoving				
front loader	79	75	E C F I H	.4
backhoes	85	75	E C F I H	.16
dozers	80	75	E C F I H	.4
tractors	80	75	E C F I W	.4
scrapers	88	80	E C F I W	.4
graders	85	75	E C F I W	.08
truck	91	75	E C F I T	.4
paver	89	80	E D F I	.1
Materials Handling				
concrete mixer	85	75	E C F W T	.4
concrete pump	82	75	E C H	.4
crane	83	75	E C F I T	.16
derrick	88	75	E C F I T	.16
Stationary				
pumps	76	75	E C	1.0
generators	78	75	E C	1.0
compressors	81	75	E C H I	1.0
Impact				
pile drivers	101	95	W P E	.04
jack hammers	88	75	P W E C	.1
rock drills	98	80	W E P	.04
pneumatic tools	86	80	P W E C	.16
Other				
saws	78	75	W	.04
vibrator	76	75	W E C	.4

Notes:

1. Estimated levels obtainable by selecting quieter procedures or machines and implementing noise control features requiring no major redesign or extreme cost.
2. In order of importance:

T	Power Transmission System, Gearing	F	Cooling Fan
C	Engine Casing	W	Tool-Work Interaction
E	Engine Exhaust	H	Hydraulics
P	Pneumatic Exhaust	I	Engine Intake

3. Percentage of time equipment is operating at noisiest mode in most used phase on site.

---

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

Table IV.2: NOISE CONTROL FOR CONSTRUCTION EQUIPMENT[1]

Source	Control Techniques	Probable Noise Reduction in dB(A)*
Engine		
exhaust	improved muffler	10
casing	improved design of block	2
	enclosure	10
fan (cooling)	redesign	5
	silencers, ducts and mufflers	5
intake	silencers	5
Transmission	redesign, new materials	7
	enclosure	7
Hydraulics	redesign, new materials	7
	enclosure	10
Exhaust (pneumatic)	muffler	5-10
Tool-Work interaction	enclosure	7-20
	change in principle	10-30

---

*Note that noise reductions are not additive. Incremental reductions can be realized only by simultaneous quieting of all sources of equal strength.

[1] U.S. Environmental Protection Agency, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances (NTID 300.1), Dec. 31, 1971.

Table IV. 3

Result of noise mufflers and acoustical enclosures on construction equipment and tools now in use (partial list).[1]

Equipment	Device	Before	After	Distance
Pile Driver Vulcan 010	none	103 dBA		25 ft.
	muffler on exh. & sound barrier on the loads		85 dBA	25 ft.
Paving Breaker Ingersall-Rand Model SB-8	none	105 dBA		3 ft.
	muffled		100 dBA	3 ft.
	muffled		85 dBA	50 ft.
	plus acous. enclosure		75 dBA	35 ft.
Diesel Drive Electric Welding Machine Lincoln Co. Model 400	none	93 dBA		23 ft.
	muffler and plus acous. enclosure		76 dBA	23 ft.
Air Compressor - (Diesel Driven) Ingersall-Rand 1200 CFM	none	105 dBA		3 ft.
	muffled		85 dBA	3 ft.
Gardner-Denver 750 CFM	none	103 dBA		3 ft.
	muffled		85 dBA	3 ft.

Table IV.3 (cont'd)

Air-tracked Drill				
Ingersall-Rand 600 CFM	none	104 dBA		23 ft.
	acous. enclosure		83 dBA	23 ft.
Garnder-Denver	none	104 dBA		23 ft.
	muffled		100 dBA	23 ft.
	plus acous. enclosure		77 dBA	23 ft.
Chain Saw				
Gasoline Driven	none	113 dBA		3 ft.
Elec. Driven	none	86 dBA		3 ft.
		72 dBA		15 ft.

---

[1] *Final Environmental Impact Statement, East 63rd Street Subway Line*, New York City Transit Authority, April 1973.

Solid Waste

To minimize the impacts of demolition and construction debris to be generated by this project, contractors will be required to remove all solid waste from the site and to dispose of it at disposal sites approved by the Commonwealth of Massachusetts, Department of Environmental Quality Engineering. The disposal of spoil material in the Commonwealth is governed by the Massachusetts Sanitary Landfill Regulations, approved and adopted by the Department of Public Health, April 13, 1971, and by Massachusetts General Laws, Chapter 111, Section 150A, as well as by other regulations. In accordance with State law, no on-site burning of debris will be allowed. To reduce the amount of debris requiring disposal, recycling efforts can be encouraged. It is anticipated that, as is the frequent practice, bricks and other material from building demolitions will be sold for recycling and wood and steel structural members and other metal will be sold for reuse or scrap.

Transportation and Traffic Circulation

Adverse impacts from construction and demolition truck traffic, including noise generation and air contamination, can be minimized by the careful routing of such traffic to avoid areas of heavy pedestrian use and other sensitive receptors as well as, to the extent possible, streets with excessive vehicular traffic. The use of local streets, however, should be greatly minimized by the nearness of the project site to the expressway systems. Nevertheless, some congestion and delays can be anticipated due to the heavy use of downtown streets and the regional expressways. In compariosn with normal daily traffic volumes, however, the added truck traffic (estimated at 134 truck-trips per day maximum) would not be significant. Careful scheduling of truck arrivals and departures to avoid rush hours and periods of peak traffic can minimize the impact of construction truck traffic. Conflicts with normal vehicular flow can be mitigated by the provision of queuing space within the site for construction vehicles, rather than requiring on-street waiting space. The impact of construction vehicles on concentration of pedestrians will be avoided, for the most part, if the TTIP project is continued beyond the demonstration year, since the downtown streets with the greatest pedestrian use would be closed to vehicular traffic.

Construction of the Lafayette Place project will require the closing of Bedford Street, which will become a major east-west arterial to replace Summer Street under the TTIP plan. The elimination of this street will be mitigated to some extent by the provision, prior to closing, of an alternative route to serve this traffic demand. At the present time, the most feasible alternative would be the construction of a temporary right-of-way along or beside the future alignment of the proposed east-west arterial south of the retail/hotel complex.

Water Quality

During the construction period, water quality will be impacted chiefly from increased amounts of suspended solids in the surface runoff due to erosion and siltation from land clearance and excavation and from wetting down of the site to reduce dust emissions. The expected increases in the suspended solid load, however, is not expected to be significant and in any case would be minimized since the ratio of the volume of the discharge water to the volume of the receiving water (Inner Harbor) would be extremely small.

In addition, the pumping of water which has collected on the site from storm events or groundwater infiltration into the City's storm sewer system could further adversely affect water quality. This impact can be reduced, however, by taking appropriate precautionary measures, such as the use of traps or other equipment designed to reduce the discharge of solids into the drainage system and by the regular cleaning of such equipment.

As noted in the air quality discussion, spillage and dirt from trucks, which would be added to the urban runoff, can be reduced or minimized by not filling trucks above their tops, by securely covering the loads, and by washing trucks and wheels before leaving the site.

To prevent further potential for water pollution, all used oil resulting from on-site truck and heavy machinery utilization should be collected and properly disposed of off-site. In addition, all sanitary waste generated during the construction phase should be collected in chemical toilets and properly disposed of by the contractors, or trailer toilets should be connected into the on-site sanitary sewer system.

Groundwater Levels

Since the excavation of the project site is expected to penetrate into the water table, potential adverse impacts on groundwater levels could result, with consequent damage to surrounding property. This will be mitigated as much as possible by excavating above the water table to the extent feasible. The underground garage is being designed with minimal intrusion of the water table. In order to insure maintenance of existing groundwater levels near the construction site, dewatering will be required. Moreover, it is recommended that contract documents specify that excavation be carried out in a manner to avoid adverse changes in groundwater levels and that a monitoring system be established, with observation on a regular basis.

Public Safety

Construction activities will also result in potential hazards to the public safety, particularly for pedestrians in the vicinity of the site. Such adverse conditions can be mitigated substantially by appropriate measures to protect the public, including the erection of fencing and barricades around the construction site, the erection of brows and canopies over sidewalk area where demolition and construction are taking place, and the provision for the safe viewing of the construction process by the general public. Construction activities will also result in the disruption of pedestrian circulation, through the closing or narrowing of sidewalk areas, which in turn can increase potential conflicts with vehicular traffic. To minimize and eliminate this danger, the developer will be required to maintain adequate and protected pedestrian walkways along the streets bordering the project area.

The construction program also will be reviewed with appropriate City agencies prior to commencement to insure the availability and access of police and fire protection apparatus and emergency first aid services. In addition, appropriate on-site construction staging areas should be designated to provide for the delivery, storage, and fabrication of materials, to ensure that there would be minimal closing or disruption of public rights-of-way or other areas.

Appropriate measures should be taken to maintain the construction site in a safe, clean, and attractive condition, and adequate security should be provided at all times to prevent the presence of unauthorized persons on the site and to insure integrity of the protective barriers erected around the site.

Aesthetics and Archaeological Resources

The construction process may temporarily degrade the aesthetics of the site, but this is only a short-term unavoidable impact which would be mitigated by the completion of the project complex. While the construction activities could be shielded from public view by solid fencing, construction activity is to many people an exciting process which they find pleasure in viewing.

Although no archaeological resources are known to exist on the site, the possibility of their presence cannot be overlooked. To minimize the loss of any such material if encountered during the site clearance and excavation stages, it is recommended that procedures be established to provide for prompt reporting of items of archaeological interest uncovered and to terminate work in the vicinity of the find until a qualified archaeologist can assess the value of such resources and ensure their proper removal and preservation.

B. Long-Term Impacts and Mitigation Measures

In the long-term, implementation of the Lafayette Place project may result in some unavoidable impacts on traffic circulation, air quality, the noise environment, utility and energy systems, and the adjacent community. Nonetheless, several specific mitigation measures can be employed to insure that the proposed project, when completed and in full use, will have minimal impact on the existing environment.

Traffic Circulation

Although vehicular traffic generated by the Lafayette Place project is not projected, in itself, to cause any congestion or circulation problems, it will be added to some street segments and intersections which, at times, may not have adequate capacity to handle their traffic volumes, and therefore the project-generated traffic may exacerbate an already deteriorated condition. This situation can occur at a few of the downtown intersections which are expected to experience a reduced level of service as a result of traffic readjustment from implementation of the TTIP plan. In most cases, the contribution from the Lafayette Place development would not be overly significant. Moreover, due to the nature of the project and the fact that the garages will emphasize short-term parking rather than encourage commuter parking, there will be a lesser impact during the normal peak-hour periods.

In order to facilitate the movement of traffic and to create a more logical circulation pattern in the vicinity of the Lafayette Place project, a number of traffic-related improvements are proposed, to accommodate both the TTIP plan and the new development. These include:

(1) the construction of the new east-west arterial to replace Bedford Street and to provide adequate capacity to accommodate much of the displaced westbound traffic from Summer-Winter Streets and Franklin-Bromfield Streets as well as to provide sufficient service to the Lafayette Place project and garages.

(2) the reversal of Bedford Street to eastbound in order to provide better connections to the expressway system from the Lafayette Place garage.

(3) the widening of Chauncy Street to accommodate two travel lanes plus an exclusive bus lane.

(4) the strict enforcement of parking prohibitions on downtown streets, the redesign of signal phasing, and the implementation of other operational improvements to increase the capacity of the existing street network and ensure smooth and efficient traffic flow to the maximum extent possible.

In addition, the entrances and exits to the Lafayette Place garage will be designed to facilitate the movement of vehicules and eliminate the potentiality for on-street queuing, which could cause congestion problems on these streets. The entrances/exits will be designed to handle a maximum of 600 inbound cars and 350 outbound cars per lane per hour, far in excess of anticipated peak-hourly volume (800 cars, 400 inbound and 400 outbound).

Although regional VMT is expected to increase by 8.5 million as a result of the project, this impact will be mitigated to some extent by the fact that the peak hours of traffic generation of the project would not coincide with the peak commuter hours, when the regional expressway and local street systems often are congested. Therefore, the street and highway network should be able to accommodate the increased VMT without undue problems. At the same time, reduction in VMT could only be accomplished by offering a more adequate and efficient regional transportation system than presently exists, especially to the more outlying suburbs of Boston.

Air Quality

Evaluation of the air quality impacts of the Lafayette Place project has indicated that while no violation of the 1-hour carbon monoxide standard is anticipated, the 8-hour standard would be exceeded at about half of the approaches to the six intersections analyzed (no violations would occur at the garage entrances/exits). However, since in most cases the Lafayette Place garage would not be the principal source of traffic at these intersections, the violations of standards would be more the result of existing, non-project traffic conditions than of the proposed development itself, although the project-related traffic certainly would contribute its share to the problem. Moreover, data-base limitations did not permit a model validation, which was felt to result in significantly higher ambient conditions than may in fact exist. Were the model calibrated, predictions of the highest 8-hour CO levels probably would drop to around the 8-hour standard. This observation, together with implementation of the proposed automobile Inspection/Maintenance program and the Federal Motor Vehicle Control Program, would have the impact of lowering future CO levels to acceptable limits. Proposed improvements to the downtown street system and strict enforcement of proposed parking regulations to facilitate the smooth flow of traffic also would tend to reduce the production of air pollutants.

Although development-related impacts from the building mechanical systems and the garage ventilation system cannot be predicted with any accuracy at this time, any potential adverse effects would be mitigated by compliance with applicable local and State permit regulations. Care will be taken in the location of garage intake and exhaust fans and of other building exhausts to avoid any adverse impacts on adjacent buildings or concentrations of population. Furthermore, use of the Edison steam system for the development's heating and air conditioning requirements would eliminate the need for any on-site fuel burning equipment (save, possibly, for restaurant cooking) and their associated emissions.

Noise Levels

Minimal long-term noise impacts are expected to result from the proposed development. Modelling studies indicate that noise levels from vehicular sources will not be significantly greater than existing conditions and will not cause any adverse impacts.

Building mechanical systems (air conditioning equipment, exhaust fans, etc.) are a second potential noise source within the project. Such impacts can be mitigated by design and location to meet or exceed applicable noise level criteria and by the selection of equipment producing noise as low as current available technology allows. In addition, compliance with the City's noise regulations will be required, and the project's developer will be committed to design the HVAC system to meet or exceed applicable noise level regulations.

Utility and Energy Systems

Although the project will increase the demand for water and energy resources and add to existing sewerage and solid waste loads, Lafayette Place is not expected to have any significant negative impact on the capability of these systems nor to threaten the availability of water or other resources. Consumption of these natural resources is, of course, an unavoidable impact of the operation of this project, but measures can be taken, such as the use of water conserving plumbing fixtures and the application of energy conservation on the design and construction of the project, to reduce the normal consumption of depletable resources.

Average daily water demand of the project will increase the total City demand by 0.27 percent. While Boston's (and the total MDC's) current demand is in excess of estimated dependable safe yields, the MDC does have in planning proposals which would increase water supply capacity to meet current and future needs adequately. Boston Edison anticipates no problems in supplying the energy requirements of the proposed project. Nonetheless, to conserve energy usage, the project will be designed to be energy efficient and appropriate conservation measures are expected to be included in the final plans. In addition, the project will comply with the recently adopted energy conservation provisions of the State Building Code (Article 22), which were adopted in accordance with the Massachusetts Energy Conservation Plan (Appendix I). This Article sets forth requirements for the design of buildings, designed primarily for human occupancy, and covers the external envelope and the selection of HVAC, service water heating, electrical distribution and illuminiating systems, and equipment for efficient use of energy.

The project also will increase the daily flow of sanitary wastewater at the Deer Island Treatment Plant by an estimated 0.13 percent. Although this addition would have no adverse impact on current plant capacity, there will be a slight increase in effluent discharge into the Boston Harbor waters. The impact of this effluent will be incurred adjacent to the outfall locations and can be expected to add to the existing poor water quality in the vicinity. This additional effluent, however, is not predicted to have any significant adverse impact on the already contaminated waters in the outfall areas. Wastewater facility improvements throughout the metropolitan Boston area, including sewer separation and interceptor reconstruction together with the upgrading of the Deer Island Plant to provide secondary treatment, will help to improve the water quality in Boston Harbor and provide a cleaner effluent discharge into the waters.

The impact of solid waste generated by the project, though not entirely avoidable, can be lessened to some extent by the use of compactors to reduce the volume of the waste and by the adoption of recycling programs. Under State regulations, all solid waste must be disposed at landfill sites or incinerators which are approved by the Department of Environmental Quality Engineering. The Commonwealth presently has underway a study of disposal sites and has initiated a long-term solid waste management strategy centering on regional resource recovery facilities as an element of the State Solid Waste Plan required by the Federal Resource Conservation and Recovery Act, passed by Congress in 1976.

Wind Effects

The construction of a 400-foot hotel tower on Chauncy Street as part of the project could result in an adverse impact due to possible aggravated wind conditions at the base of the tower. To avoid this condition, and to ensure that there will be adequate protection to the pedestrian environment, the BRA will require a complete wind tunnel simulation analysis be carried out as a condition of the design review process.

Historic Resources

In order to minimize any potential adverse impacts on adjacent historic properties, particularly the Washington Street Theatre District, final plans of the project will be subject to review by the State Historic Preservation Officer and the Boston Landmarks Commission.

Chinese Community

The Lafayette Place project can result in both positive and negative impacts on the adjacent Chinese community. Beneficial impacts will include increased job opportunities in the project for the Chinatown residents, new pedestrian connections to the downtown retail center, and an improved environment on lower Washington Street. On the other hand, potential adverse impacts could involve increased vehicular traffic in the Chinatown area, which would further deteriorate the already poor air quality in the area and would increase health hazards for residents; the creation of a negative image of Chinatown as an area to be avoided, which would discourage tourists from visiting the area; and an increase in development pressures and real estate speculation in the Chinese community.

In order to avoid these problems to the maximum extent possible, the BRA has worked and will continue to work with the Chinese community as part of its neighborhood planning program to mitigate the possible negative impacts from the project and to pursue positive effects for Chinatown businessmen and residents. To accomplish this, several measures can be developed and implemented by the City. Apprehension regarding increased traffic can be mitigated by designing vehicular circulation around Chinatown, possibly closing or restricting the use of Beech Street to prevent its use as a by-pass to the downtown, and reserving on-street parking for residents, merchants, and tourists to Chinatown. The image of the Chinese community can be upgraded by improving City services such as street cleaning and trash collection, strengthening the linkage between Chinatown and the retail core through the project area, and by including retail space within the complex for Chinese merchants. These measures, in turn, could result in positive impacts on the Chinese restaurant and business community by improving the attraction of the area to tourists. Finally, to mitigate the concern of increased development pressures, the City should pursue policies to discourage real estate speculation in Chinatown, develop a housing program for the area, revise tax policies, and in general, build up a neighborhood confidence to spur additional Chinese investment in the area. Support by the City of these measures would, in turn, reinforce the plans of the Chinese Economic Development Council to implement a program to upgrade and expand the Chinatown neighborhood, and to improve the community's economic opportunities, and to develop a viable link with the new Lafayette Place project. The strategy outlined in the recently-published Lower Washington Street Area planning report by the BRA is a beginning in this direction.

PART V RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Part V RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

National environmental policy, as expressed in the National Environmental Policy Act, has described each generation as a trustee of the environment for succeeding generations and, as such, having the responsibility to weigh all factors which would tend to narrow the option for future beneficial uses of the environment or pose long-range risks to public health or safety. In this context, "short-term" is defined as the time span of the construction period of the Lafayette Place project, while the "long-term" refers to that period of time in which all significant consequences of the proposed project will be implemented.

As indicated in Part II of this Statement, the proposed project will have both short-term and long-term impacts, with related costs and benefits dispersed differently. Short-term impacts are potentially negative, and are related to the construction activities. Primary negative impacts are increased noise levels and air pollution, localized disruption of pedestrian and vehicular traffic, a greater potential for water pollution from runoff, the generation of demolition and excavation debris, hazards to public safety, and irreversible resource commitments. The costs of these impacts, which represent a loss to environmental quality, will be shared by all the users of the local environment - the local businessman, the local shopper, the visitor and the traveler through the area. Other short-term aspects of the project, which entail cost outlays for demolition and construction labor, and equipment and material commitments, realize short-term beneficial returns in the form of employment, personal income and business excise taxes, and new economic activity (multiplier effect).

Long-term impacts are expected to be primarily positive, although the project will result in some negative impacts. The most significant positive impact will result from the construction of a modern and attractive retail center and hotel complex in the retail core of the City of Boston, which will continue and strenghten the economic revitalization that the Central Business District recently has begun to experience. Costs will be shared by Federal and local governmental agencies and private entrepreneurs, and the benefits should accrue primarily to all the City of Boston and secondarily to the Boston metropolitan area. Other positive impacts include the elimination of blighting conditions and the physical and aesthetic upgrading of the area, the improvement of investor confidence in this section of the downtown, the arrest of further deterioration in the project's vicinity, and substantial social and economic benefits in the form of employment opportunities, payroll, sales, and real estate taxes, retail sales, and visitor and convention business. Benefits due to these impacts will generally be accrued by most interests in the City.

The major long-term negative impacts of the proposed project, which must be weighed against its long-term benefits, include increased traffic generation and increased use of the local street network, with potential circulation conflicts, slightly increased noise and air pollution levels, additional burden on utility systems, including greater water consumption and sewage generation, increased depletion of energy resources, and potential development pressure on the adjacent Chinatown area. The project also represents a continuation of urban development of the site, which has undergone alteration by man since the mid 1600's, with consequent effects on the area's land, water, and air resources. The proposed project will continue to affect these natural systems, but not necessarily adversely to any significant degree. The costs of these adverse impacts will be primarily local and can be minimized through careful design and mitigation measures.

PART VI IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Part VI IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project will result in some irreversible and irretrievable commitments of resources. Development of the project as planned will involve the irretrievable commitment of some six acres of land in the downtown Boston area and will foreclose all options for alternative uses of the land during the buildings' lifetime. However, the commitment of this resource is not expected to involve the loss of any significant natural feature, historical property, or any unique views or resources.

Construction activity for the new buildings and public improvements requires the irreversible commitment of materials, labor, and energy resources. The project will require an estimated 1,467 man-years of construction labor over a four-year period, which will preclude its use elsewhere. To this estimate should be added an increment to account for the time of the developer, project architects and engineers, contractors, consultant firms, and the public agencies involved in reviewing the project. The project will also commit building material resources, which are irretrievable. Although these commitments cannot be quantified at this time, they would include such materials as concrete, structural steel, brick, wood, and glass, most of which are depletable.

The total cost of this project, both public and private, is estimated at $71.8 million. Wages paid to construction workers are estimated to amount to $24.2 million. The remainder of the total project cost - $47.6 million - represents cost of materials, architect's fees, basic construction cost, financing and carrying costs, and other costs associated with a major real estate development. All of these are irretrievable costs. The ability of the community to generate revenue and the accumulated capital, both public and private, to accomplish the project thus represents an irreversible commitment of fiscal resources. For the public sector, this commitment could represent either an increased tax burden or a reduction in the level of funding of existing City programs should additional revenue sources not be available.

Upon completion of the proposed project, there will be the commitment of utility and community services to support the project. These services also will involve the irretrievable use of labor, materials, and energy resources. While none of these resources is considered unique, some material and energy resources are, in the long run, irreplacable since they are non-renewable.

LAFAYETTE PLACE

DRAFT
ENVIRONMENTAL
IMPACT
STATEMENT

APPENDICES

JULY 1978

CITY OF BOSTON /
BOSTON REDEVELOPMENT AUTHORITY

APPENDICES

A. Bibliography
B. Bedford-West Urban Renewal Plan Excerpts
C. State and Regional A-95 Comments
D. Logs of Test Borings and Soil Profiles
E. Boston Transit and Traffic Improvement Program
F. Parking Demand and Traffic Generation Calculations
G. Estimation of Daily Water and Sewage Demand
H. Estimation of Construction Debris
I. Massachusetts Energy Code
J. Air Quality Meteorological and Monitoring Equipment Specifications
K. Air Quality Impact Analysis
L. Parking Freeze Application and Permit
M. VMT Analysis
N. Downtown Boston Noise Survey
O. Lafayette Place Noise Survey Analysis and Worksheets
P. Evaluation of Noise Levels According to Traffic Characteristics
Q. Boston Harbor Water Quality Survey - Excerpts
R. Solid Waste Generation Estimates
S. Letter from State Archaeologist
T. Section 106 Historic Preservation Determination
U. Comments of Boston Landmarks Commission
V. Boston and Massachusetts Air and Noise Pollution Regulation - Excerpts
W. Massachusetts Environmental Notification Form

Appendix A

BIBLIOGRAPHY (Principal Sources)

1. General

Boston Redevelopment Authority, Bedford-West Urban Renewal Area (Mass R-182), Applicants Environmental Information, prepared for U.S. Department of Housing and Urban Development, Boston, February, 1974.

________, Charlestown Navy Yard Urban Renewal Plan Amendment, Final Environmental Impact Report, Boston, January, 1977.

____________, A Comprehensive Planning and Environmental Analysis of the Jordan Marsh/Lafayette Place Complex, Boston, May 1975.

________, Final Environmental Impact Statement, Sixty State Street, prepared by Cabot, Cabot & Forbes, Co., Abt Associates, Inc., and Resource Planning Associates, Inc., Boston, June, 1974.

________, "Jordan Marsh/Lafayette Place," Boston, April, 1975.

________, South Station Urban Renewal Project, Environmental Impact Report, prepared by Metcalf and Eddy, Inc., Boston, March 1976.

________, Supplemental Environmental Impact Report, Park Plaza Urban Renewal Project, Boston, 1976.

City of Boston, Lafayette Place, Application for Urban Development Action Grant, Boston, January, 1978.

2. Land Use/Physical Characteristics

Boston Redevelopment Authority, 1965/1975 General Plan for the City of Boston and the Regional Core, Boston, 1965.

City of Boston/Boston Redevelopment Authority, Lower Washington Street Area - A Program for Revitalization, Boston, June, 1978.

Victor Gruen Associates, Inc., Boston Central Business District Planning Report, October 30, 1967.

3. Land Condition

Haley & Aldrich, Inc., Report on Pilot Test Borings and Groundwater Observation Wells, Lafayette Place Boston, Massachusetts, Cambridge, May, 1974.

United States Geological Survey and Massachusetts Department of Public Works, "Ground-Water Levels on Boston Peninsula, Massachusetts." Hydrologic Investigations Atlas HA-513 (by John E. Cotton and David F. Delaney), Reston, 1975.

4. Transportation Network

Barton-Aschman Associates, Inc., Site Analysis Lafayette Place, Boston, Massachusetts, prepared for SEFRIUS, Developers, Washington, D.C. July, 1974, (with update, April, 1978).

Boston Redevelopment Authority, Boston, Transit and Traffic Improvement Program - Final Demonstration Grant Application (to Urban Mass Transportation Administration), Boston, March, 1978.

Boston Traffic and Parking Department, Cordon Count, Dowtown Boston, 1974.

Massachusetts Bay Transportation Authority, Central Area Systems Study, Vol. 1, Boston, June, 1971.

Massachusetts Executive Office of Transportation and Construction, Technical Supplement to the Program for Mass Transportation, Vol. II, Existing Plant and Facilities , Boston, April 1977, (draft).

5. Air Quality

Bolt Beranek and Newman, Inc., Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage, prepared for Boston Redevelopment Authority, Cambridge, June, 1978.

Massachusetts Air Surveillance Network (Department of Environmental Quality Engineering, Division of Air and Hazardous Materials), "1976 and 1977 Continuous Air Quality Summaries," Boston, April 1978.

Massachusetts Department of Environmental Quality Engineering, Division of Air Quality Control, "Monthly Summary of Continuous Data," January-December, 1975.

Parsons, Brinckerhoff, Quade & Douglas, Inc., "Lafayette Place Air Quality Monitoring Study", April 1978.

U.S. Environmental Protection Agency, "Air Pollution Status of Urbanized Areas with Populations of More than 200,000 People", February 23, 1978 (published in Bureau of National Affairs, Environemental Reporter, March 3, 1978).

_______, Transportaion Controls to Reduce Motor Vehicle Emissions in Boston Massachusetts (APTD-1442), Research Triangle Park, December, 1972 (prepared by GCA Corporation Bedford, Massachusetts).

6. Water Quality

Massachusetts Executive Office of Environmental Affairs, Massachusetts Water Supply Policy Study, prepared by Wallace, Floyd, Ellenzweig, Moore, Inc., Cambridge, January, 1977.

Massachusetts Water Resources Commission, Division of Water Pollution Control, _A Pollution Survey of Boston Harbor_, Boston, April, 1973.

_______, Rules and Regulations for the Establishment of Minimum Water Quality Standards for the Protection of the Quality and Value of Water Resources, Boston, May 2, 1974.

7. Socio-Economic Environment

Boston Redevelopment Authority, _Boston, A Special City_, (n.d.)

_______, _A Growth Strategy for Boston's Hotel and Convention Industry_, Boston, May, 1977.

_______, _Planning in Downtown - An Interim Draft_, Boston, 1974.

8. Historic Resources

Boston Redevelopment Authority/Boston Landmarks Commission, "CBD National Register and Boston Landmarks Status" (map), February, 1978.

U.S. Department of the Interior, Heritage Conservation and Recreation Service, "National Register of Historic Places - Annual Summary of Historic Properties", published in _Federal Register_, February 7, 1978, Part II.

BOSTON REDEVELOPMENT AUTHORITY

URBAN RENEWAL PLAN

CENTRAL BUSINESS DISTRICT - BEDFORD-WEST

(EXCERPTS)

PROJECT NO. MASS. R-

JANUARY, 1973

CHAPTER II: OBJECTIVES

Section 201: Basic Objectives

The basic objectives of the CBD - Bedford-West Urban Renewal Plan are:

1. To aid in reversing the economic decline of the older commercial sector of the City;

2. To promote and expedite public and private development and investment in the area through new commercial facilities and the improvement of public utilities and services;

3. To strengthen and expand the real property tax base within the area;

4. To facilitate the efficient use of land within the area for commercial and public purposes;

5. To improve the basic traffic circulation system in the area and to eliminate conflicts between pedestrians, trucks and automobiles.

Section 202: Planning Objectives

Planning objectives of the project include the following:

1. To eliminate, to the maximum extent feasible, conflict between free flowing traffic, pedestrian movement and on-street truck servicing;

2. To regulate access to off-street parking and loading areas so as to reduce conflict between pedestrians and vehicles and at the same time to allow for more efficient functioning of the street system;

3. To remove an economically obsolete and substandard building which blights the area and, in its present condition, inhibits investment;

4. To encourage intensive new development so as to provide a stimulus for economic growth in the district as a whole.

Section 203: General Design Objectives

The design objectives for reuse in the Project Area are as follows:

1. To recognize the special significance of the urban nature of the built-up Central Business District and to enhance its character by the encouragement of a multi-story and multi-use building so as to maintain the urban environment.

2. To place special emphasis on preserving and extending the pedestrian amenities of downtown Boston by:

    (a) The creation of pedestrian areas to improve the environment for shoppers, workers, and visitors;

    (b) The provision of easy and pleasant pedestrian connections within the Project Area and adjacent areas;

    (c) The provision of a system of varied and lively pedestrian paths both through and between development sites which can give ready access to ground floor commercial enterprises of all types;

    (d) The regulation of access to off-street parking and loading areas to reduce conflict between pedestrians and vehicles and at the same time to allow more efficient functioning of the street system.

3. To encourage diversity in construction and in land use provided that respect for neighboring properties and the urban environment is maintained.

CHAPTER VI: LAND USE AND BUILDING REQUIREMENTS

Section 601: Land Use Plan

The use of land in the Project Area shall be as shown on Map 2, "Proposed Land Use," which indicates proposed land uses and rights-of-way.

Section 602: Land Use and Building Requirements

A. General

1. The use and development of land and improvements shall be in accordance with the requirements of this Chapter.
2. The disposition parcel is located as shown on Map 3, "Disposition Map".
3. The Authority may subdivide the disposition parcel as appropriate. In the event of subdivision, the permitted uses will be applicable to sub-parcels and parking requirements will be divided as appropriate.
4. Use controls as set forth in this Chapter shall be interpreted to permit supporting and ancillary uses which are reasonably associated with the primary use.
5. Floor Area Ratio (F.A.R.) shall mean the ratio of floor area of a structure or group of structures to total parcel area, as more fully defined in the Zoning Code of the City of Boston.

B. Land Use Requirements

The project area shall generally be devoted to a combination of any of the following uses: retail commercial, office, and parking. In each case, and unless specifically otherwise provided, designation of a particular use includes all accessory and ancillary uses, customarily or reasonably incident to the use specified or the use on an adjoining parcel. Within the purview of this Section, the Authority may permit on any parcel such uses as are consistent with the objectives of the Project.

C. Building Requirements and Restrictions

1. Open Space. All open areas shall be suitably landscaped and/or paved so as to provide a visually attractive environment.

2. Off-Street Loading.

NUMBER OF BAYS REQUIRED BY GROSS FLOOR AREA OF STRUCTURES

Gross Floor Area (in thousands of square feet)	Office and General Commercial	Retail and Wholesale
Under 15	0	0
15-50	1	1
50-100	1	2
100-150	2	3
150-300	3	4
300 and over	4*	5*

*Plus 1 for each additional 150,000 square feet

The above controls shall apply unless a developer or owner can demonstrate to the satisfaction of the Authority that the off-street loading needs of the property will be met adequately in other ways, or that the lack of such loading facilities will not be detrimental to surrounding areas of the Project. Loading bays shall be designed so as to permit vehicles to load and unload without interfering with pedestrian or vehicular traffic on rights-of-way; but in no case shall loading bays designed to permit vehicles to back directly perpendicular to rights-of-way be permitted.

3. Other On-Site Improvements. All improvements on the land, including buildings, landscaped areas, and parking areas, shall be properly maintained in good condition. Sufficient and suitable refuse and garbage storage and disposal facilities, including structural enclosures where appropriate, shall be provided and properly maintained. Open storage of materials, equipment or merchandise shall not be permitted.

4. Sign Control. Signs within the Project Area shall be restricted to an identification of the establishment and the nature of its products. All signs must be suitably integrated with the architectural design of the structure which they identify. All signs, billboards or advertising shall be in conformance with the Boston Zoning Code as amended. The size, design, location and number of signs, the placement or replacement of any sign or any exceptions to the above controls shall be subject to the approval of the Authority.

5. Parking. All parking structures shall be designed so as to provide one entrance lane for each 300 parking spaces provided. Each entrance lane must have sufficient reservoir space to avoid vehicle backup onto public streets. All parking shall be enclosed.

6. Utilities. The placement or replacement of all private and public utilities shall be underground. The disposition parcel may be subject to easements and other rights as appropriate in accordance therewith.

7. Handicapped Persons Provisions. All new buildings in the Project Area shall be so designed that persons in wheelchairs can enter and leave and travel about the building in a reasonable manner without due obstruction.

Section 603: Controls on Disposition Parcel

Parcel C-1

Permitted Uses: Retail commercial, office, and parking
Ground floor on all frontages to be devoted to retail commercial uses.

Alternative Use: Transient Housing.

F.A.R.: Minimum 3, maximum 10.

Parking: Maximum 700 spaces if adjacent Hayward Place garage is removed. Otherwise, an enclosed parking structure with maximum of 300 spaces will be permitted as part of the redevelopment.

Other Requirements:

(a) Service access from Norfolk Place and Harrison Avenue Extension only.

(b) Parking access from Norfolk Place and Harrison Avenue Extension only.

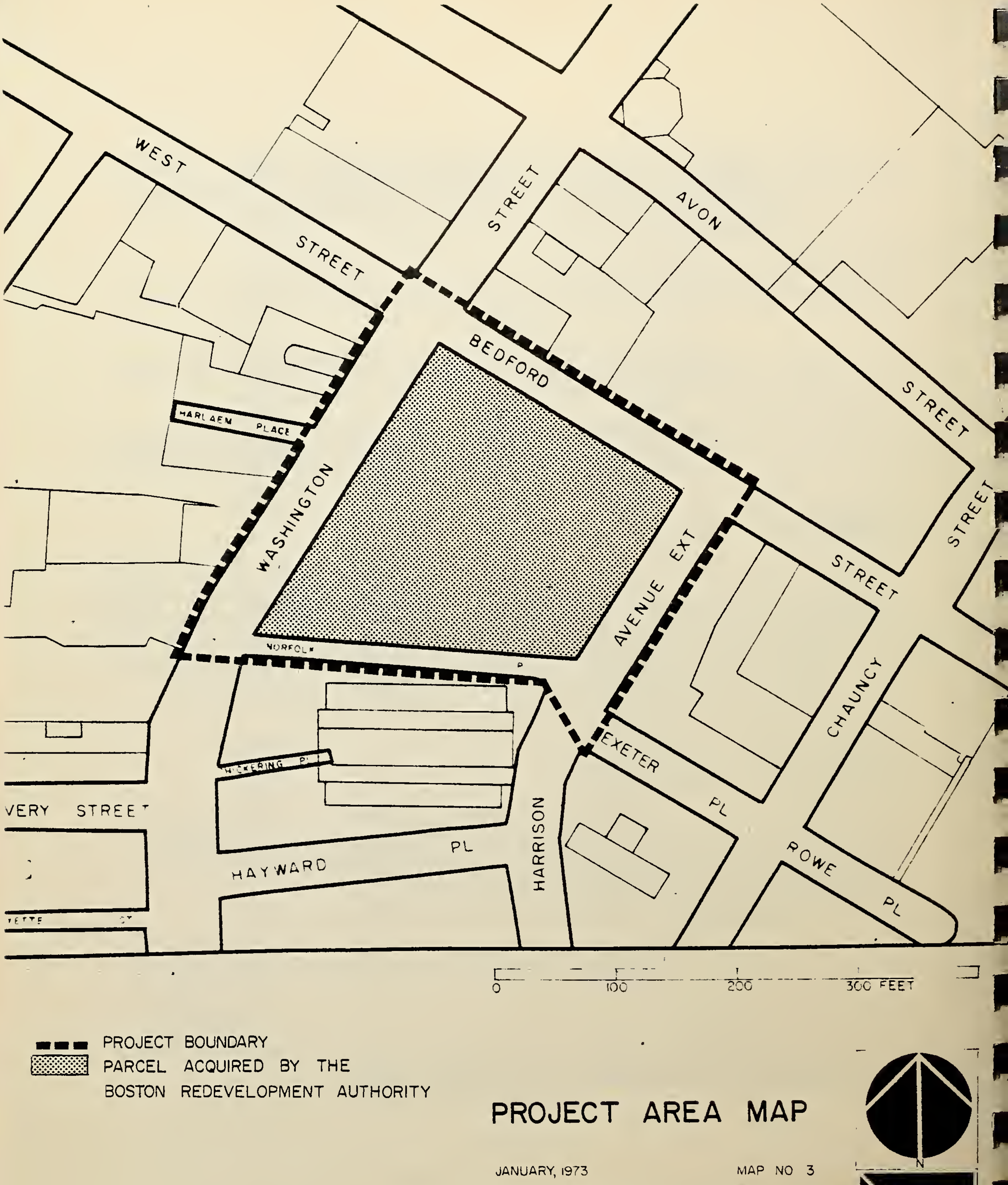
(c) Land uses, access and design shall be planned so as to integrate with the redevelopment and reuse of contiguous parcels.

Section 604: Controls on Contiguous Parcels

In the event that the Authority disposes of the reuse parcel or any subdivision of the reuse parcel to a developer who owns a contiguous parcel not part of the clearance or disposition area, the Authority reserves the right to impose such controls as are necessary to insure that the use and development of both parcels will be in conformity with the objectives of the Plan. The disposition of the reuse parcel shall take place so as to encourage the renewal and redevelopment of contiguous parcels.

Section 605: Interpretation

In the event of any question or questions regarding the meaning or construction of any land use and building requirements in this Chapter, the reasonable interpretation or construction thereof by the Authority shall be final and binding.



▬▬▬ PROJECT BOUNDARY

▨ PARCEL ACQUIRED BY THE BOSTON REDEVELOPMENT AUTHORITY

PROJECT AREA MAP

JANUARY, 1973 MAP NO 3

CBD BEDFORD - WEST
URBAN RENEWAL AREA
MASSACHUSETTS R-

Boston Redevelopment Authority

Appendix C

THE COMMONWEALTH OF MASSACHUSETTS

OFFICE OF STATE PLANNING
JOHN W. McCORMACK BUILDING ROOM 2101
ONE ASHBURTON PLACE
BOSTON, MASSACHUSETTS 02108
(617) 727-5066

MICHAEL S. DUKAKIS
GOVERNOR

FRANK T. KEEFE
DIRECTOR

February 28, 1978

MAR 1 1978

The Honorable Kevin H. White
City Hall
Boston, MA 02201

Attention: John Drew, Director of Federal Aid

Re: A-95 Review/Boston UDAG Applications
State Application Identifier: 77121835 Blue Hill Avenue
77121836 Charlestown Shipyard
77121837 Boston Marine Industrial Park
77121838 Lafayette Place

Dear Mayor White:

Your applications requesting a total of $26,396,560 in Urban Development Action Grant funds from the Department of Housing and Urban Development has been received for review. These funds would provide for public investment keyed to related private development projects in four areas of focus for the Boston Plan: Blue Hill Avenue, Charlestown Shipyard, Boston Marine Industrial Park, and Lafayette Place.

As the Governor's designated State Clearinghouse, our review follows the guidelines of OMB Circular A-95. It is designed to provide advisory comments on the consistency of your proposal with State plans, policies, and objectives.

During our review of your proposal, a summary was published in the A-95 Review Monitor, which is distributed to over fifty State agencies. Any interested agency was provided with the opportunity to evaluate your proposal for consistency with its particular policies and objectives. The enclosed comments have been received from the Massachusetts Historical Commission (MHC), Department of Environmental Quality Engineering (DEQE), the Office of Coastal Zone Management (CZM), and the Massachusetts Commission Against Discrimination (MCAD).

The Massachusetts Historical Commission cites the need for a Section 106 review for the Blue Hill Avenue and Charlestown Shipyard projects, and requests that plans for buildings fronting Washington Street in the Lafayette Place project be submitted to their office for review in accordance with the National Historic Preservation Act. The Department of Environmental Quality Engineering reminds the applicant of the need for state permits for both demolition activity and the operation of the parking garage.

The Office of State Planning also reviewed these proposals and found them to be consistent with the State's growth and economic development policies. We have in previous reviews repeatedly expressed our strong support for the Charlestown Shipyard redevelopment which will add major new waterfront open space and residential components strengthening the Charlestown community. The Boston Marine Industrial Park has also been supported in previous reviews by this office. This industrial park offers Boston the unique opportunity to attract jobs to an industrial site with excellent harbor access. We also support the Lafayette Place and Blue Hill Avenue proposals which will assist the city to combat urban blight and retain important retail and commercial activities in those critical areas.

The comments received from the Massachusetts Commission Against Discrimination recommend specific conditions for inclusion in these UDAG grants. For the conditions proposed see Section IV (Page 12) of the MCAD's comments (attached).

The Office of State Planning supports the MCAD's comments and therefore, our concurrence is conditional upon inclusion of the MCAD's conditions in any UDAG grant award. These conditions should be included in order to adequately insure compliance with equal opportunity requirements and to assure that the city will continue to work with MCAD to meet its affirmative action goals in housing and employment. We trust that the Department of Housing and Urban Development will consider all of these comments and include this list of conditions in any UDAG grant award to the city.

Thank you for your continued cooperation during this review process.

Sincerely,

Robert Patterson
Deputy Director for:
Frank T. Keefe
Director of State Planning

/lms
Enclosures
cc: Jane Edmonds, MCAD
Elizabeth Amadon, MHC
Thomas McShane, DEQE
Sara Carroll, CZM
Lorraine Payne, MAPC
Marcia Dodge, HUD, UDAG Office
Susan Lang, HUD Area Office

OFFICE OF STATE PLANNING

PROPOSAL REVIEW FORM

TO:
Elizabeth Amadon
Mass. Historical Commission

DATE: January 9, 1978

77121838

The following proposal has come before the Office of State Planning for its review. We are actively soliciting input on this proposal before taking any action. We would appreciate your comments or any information which you think would be helpful. If you have any questions, please feel free to contact the O.S.P. person identified below.

PROPOSAL:
Lafayette Place
SEE ATTACHED

PROPONENT: City of Boston

OTHER SIGNIFICANT ACTORS:

LOCATION OF PROPOSAL:

OTHER RELEVANT INFORMATION (FUNDING, ETC.):

REVIEW REQUIRED:

☒ State Clearinghouse (A-95) review. In your review, focus on the proposal's compatability with your agency's plans, programs, and objectives.

☐ Environmental Impact Statement and/or Environmental Impact Report.
You are not required to comment on the advisability of the proposal; your review should focus on the adequacy of the E.I.S., E.I.R. (See below.)

Information is needed for us to better evaluate. Specific information (if any) requested.

☐ For your evaluation and comment.
☐ For your information; comment if you wish.
☐ Other:

RECEIVED
JAN 10 1978
MASS. HIST. COMM.

OFFICE OF STATE PLANNING CONTACT PERSON: Curt Danforth
PHONE:

REPLY DUE: January 23, 1978

For your convenience, you may use the space below for your comments. Alternatively, you may return your review, comments, and/or information on an attached sheet.

☐ Concur with proposal; no comment.
☐ Concur with proposal; comments attached.
☒ Concur conditionally with proposal; conditions attached.
☐ Need more information; questions attached.
☐ Do not concur with proposal; explanation attached.
☐ E.I.S./E.I.R.: report found to be adequate, comments (if any) attached.
☐ E.I.S./E.I.R.: report found inadequate; noted inadequacies attached.
☐ Requested information attached.
☐ Requested information is unavailable.
☐ Have no comment, as proposal is not relevant to our concerns.

COMMENTS:
The Washington Street Theater District between Avery and West Streets has been voted eligible for listing in the National Register of Historic Places. Although we concur with the project, this office must be provided an opportunity for review of the plans in accordance with the National Historic Preservation Act and 36 CFR 800. Plans for buildings which will front on Washington Street across from the National Register district should be designed so that they do not adversely affect the historic properties in terms of incompatible scale, etc. Please contact us if we can be of further assistance.

SIGNATURE: Eliz. A. Amadon
DATE: 1/20/78

REVIEWER (IF DIFFERENT FROM SIGNATORY): MW

NOTE: Reviewer: Return white copy to OSP; retain yellow copy for your files (OSP retains pink copy of review request.)

OFFICE OF STATE PLANNING

PROPOSAL REVIEW FORM

TO:
Hyman Steinhurst
Dept. of Environmental Quality Engineering

DATE: January 9, 1978

77121838

The following proposal has come before the Office of State Planning for its review. We are actively soliciting input on this proposal before taking any action. We would appreciate your comments or any information which you think would be helpful. If you have any questions, please feel free to contact the O.S.P. person identified below.

PROPOSAL:

Lafayette Place

☐ SEE ATTACHED

PROPONENT: City of Boston

OTHER SIGNIFICANT ACTORS:

LOCATION OF PROPOSAL:

OTHER RELEVANT INFORMATION (FUNDING, ETC.):

REVIEW REQUIRED:

☒ State Clearinghouse (A-95) review. In your review, focus on the proposal's compatability with your agency's plans, programs, and objectives.

☐ Environmental Impact Statement and/or Environmental Impact Report. You are not required to comment on the advisability of the proposal; your review should focus on the adequacy of the E.I.S., E.I.R. (See below.)

Information is needed for us to better evaluate. Specific information (if any) requested.

☐ For your evaluation and comment.

☐ For your information: comment if you wish.

☐ Other:

OFFICE OF STATE PLANNING CONTACT PERSON: Curt Danforth PHONE:

REPLY DUE: January 23, 1978

For your convenience, you may use the space below for your comments. Alternatively, you may return your review, comments, and/or information on an attached sheet.

☐ Concur with proposal; no comment.

Concur with proposal; comments attached.

☐ Concur conditionally with proposal; conditions attached.

☐ Need more information; questions attached.

☐ Do not concur with proposal; explanation attached.

☐ E.I.S./E.I.R., report found to be adequate, comments (if any) attached.

☐ E.I.S., E.I.R.: report found inadequate; noted inadequacies attached.

☐ Requested information attached.

☐ Requested information is unavailable.

☐ Have no comment, as proposal is not relevant to our concerns.

COMMENTS: The proponents should be aware that approvals for demolition, construction, and eventual operation of the parking garages may require approvals from the Department of Environmental Quality Engineering, Division of Air & Hazardous Materials. For clarification, proponents should contact Mr. John Desmond, Director of the Metropolitan Boston Air Pollution Control District, DEQE, at 727-2658.

SIGNATURE: Thomas P. McShane DATE January 12, 1978

REVIEWER (IF DIFFERENT FROM SIGNATORY): Richard Bates, DEQE

ROOM 2101 · ONE ASHBURTON PLACE · BOSTON, MASSACHUSETTS · 02108 · PHONE: 617-727-5066

NOTE: Reviewer: Return white copy to OSP; retain yellow copy for your files (OSP retains pink copy of review request.)

mapc

Metropolitan Area Planning Council
44 School Street Boston, Massachusetts 02108

Carla B. Johnston
Executive Director

(617) 523-2454

February 23, 1978

The Honorable Kevin H. White
Mayor, City of Boston
City Hall
Boston, Massachusetts 02201

RE: HUD/CDBG Urban Development Action Grant Program - The Boston Plan: Charlestown Naval Shipyard, Boston Marine Industrial Park, Lafayette Place, Blue Hill Avenue. (MAPC #A-78-65; Received January 18, 1978).

Dear Mayor White:

In accordance with the provisions of the U.S. Office of Management and Budget Circular A-95, the Metropolitan Area Planning Council, as metropolitan clearinghouse, has reviewed the above-referenced application for Federal financial assistance.

In the course of our review, the MAPC circulated summaries of the UDAG application to members of our minority caucus. Enclosed are the comments of Mr. Syvalia Hyman III, Associate Director of the United South End Settlements. Please note Mr. Hyman's concern that the City's application comply with a CDBG agreement with the Massachusetts Commission Against Discrimination (MCAD).

The Council supports the utilization of UDAG funds as an initial step toward the realization of the Boston Plan. The proposed activities will not only stimulate financial benefits for residents of Boston but also impact favorably on the economy of the entire metropolitan area.

Very truly yours,

Carla B. Johnston

Carla B. Johnston
Executive Director

RP/md
Enclosure
cc: Ms. Gail P. Rotegard, MAPC rep., Boston
Mr. Philip Zeigler, Boston Redevelopment Authority
Mr. Frank T. Keefe, Office of State Planning
Secretary Patricia Harris - HUD

mapc

Metropolitan Area Planning Council
44 School Street Boston, Massachusetts 02108

Carla B. Johnston
Executive Director

(617) 523-2454

A-95 REVIEW REQUEST

TO: Mr. Syvalia Hyman, III
United South End Settlements

DATE: January 19, 1978

I.D.#: #A-78-65

Enclosed is a description of a proposal being reviewed by the Metropolitan Area Planning Council in its advisory role as areawide clearinghouse for metropolitan Boston. To assure that this project is consistent with local and regional plans and programs, the Council requests your evaluation and comments.

NOTE: Whenever an A-95 involves more than 5 communities you will have the option of attending a briefing.

APPLICANT: City of Boston

ACTIVITY: Urban Development: Boston Marine Industrial Park; Lafayette Place; Charlestown Shipyard; & Blue Hill Avenue

C.F.D.A.#: HUD/Urban Development Action Program

In order for the Council to meet the required deadline for filing its review, your comments must be received at the MAPC by: FEBRUARY 9, 1978

☐ Concurrence

☒ Additional Information Needed (Questions Below)

☐ Non-concurrence (Explanation Below)

☐ No Comments (Not Relevant To Our Programs)

EXPLANATORY COMMENTS:

The extent to which the City of Boston is in compliance with its CDBG Agreement with the Mass. Commission Against Discrimination.

SIGNATURE: Syvalia Hyman III DATE: February 6, 1978

APPENDIX D

Logs of Test Borings Prepared by C. L. Guild
Drilling & Boring Co., Inc., Avon, Massachusetts

SUMMARY OF PILOT TEST BORINGS
LAFAYETTE PLACE, BOSTON

		ELEVATIONS OF TOP SURFACE			
Boring No.	Depth Of Boring (Ft.)	Ground Surface	Marine Deposits	Glacial Till	Bedrock
B1	85	29.6	-4.4	-14.4	-43.4
B2	7	26.8	--	--	--
B3	62	28.1	21.6	-16.9	--
B4	67	33.4	19.4	-16.6	--
B5	56.5	30.7	20.2	-8.8	--
B6	112.5	30.5	18.0	-24.5	-62.0
B7	90.3	36.5	21.5	1.5	--
B8	57	33.3	19.3	-4.7	--
B9	62	30.1	20.1	-22.9	--
B10	106	29.3	16.3	-30.7	-64.7

NOTES

1. Refer to Figure 2 for locations of test borings.

2. Refer to **Attachment** for logs of test borings prepared by driller.

TABLE I

SUMMARY OF GROUNDWATER OBSERVATIONS
LAFAYETTE PLACE, BOSTON

	ELEVATION OF WATER IN OBSERVATION WELL					
Date	O.W. 1 Tip El. -8.5	O.W. 2 Tip El. -2.6	O.W. 3 Tip El. -5.1	O.W. 4 Tip El. -4.0	O.W. 5 Tip El. -3.1	O.W. 6 Tip El. -2.7
4/24/74			Filled			
4/25/74			3.2			
4/26/74			2.6			
4/29/74			2.8			
4/30/74						Filled
5/1/74						-0.8
5/2/74		Filled	2.6			-1.4
5/3/74		0.0	2.6			-1.4
5/6/74		0.1	2.6			-1.4
5/7/74		0.0	2.6			-0.2
5/8/74	Filled	-1.1	See Note 3			-0.3
5/9/74	5.8	-1.0				-0.4
5/10/74	6.2	0.1		Filled	Filled	11.3
5/13/74	3.1	0.3		7.6	12.7	1.9
5/22/74	-1.2	0.3		7.5	3.5	-1.2
5/24/74	0.1	0.3		7.5	--	--

NOTES

1. Refer to Figure 2 for locations of observation wells.

2. O.W. 3 was destroyed by bulldozer working on site, see text.

TABLE II

Table 3
MAJOR SUBSURFACE STRATA

Soil Profiles A-A, B-B, C-C

		Description
A	FILL	Loose to compact mottled brown granular soils, with intermixed clay, brick, wood, cinders, concrete, and other miscellaneous materials.
B	MARINE DEPOSITS	Interbedded medium stiff to very stiff yellow brown to gray silty clay and medium compact to compact rust-brown to gray brown fine SAND overlying a soft to stiff silty clay with fine sand lenses.
C	GLACIAL TILL	Medium compact to very compact gray fine sandy SILT with varying amounts of gravel, clay, and coarse to medium sand.
D	BEDROCK	Very soft to soft mottled gray ARGILLITE with associated gabbro dike rocks and quartz veins.

NOTES

1. Test boring 12 made for Boston Edison Co. by C.L. Guild Drilling & Boring Co., Inc. December 1972. Soil descriptions have been modified to conform to soil classification system used for borings B-1 through B-10.

2. The soil classification used by Haley & Aldrich in borings B-1 through B-10:

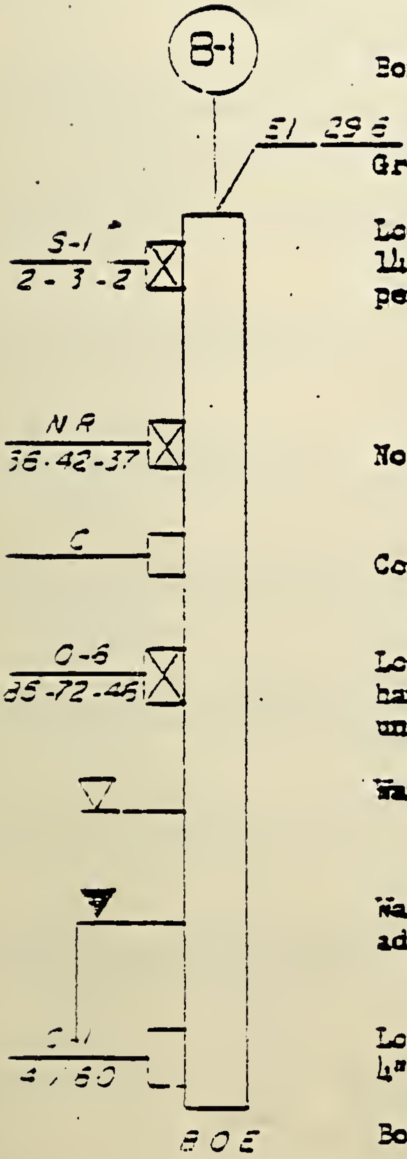
Blows/Ft.	Density	Blows/Ft.	Consistency
0-4	Very Loose	0-2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Compact	4-8	Medium Stiff
30-50	Compact	8-15	Stiff
50+	Very Compact	15-30	Very Stiff

Major soil component = Upper case letters
Secondary component = Adjective used (if 20-50% of total)
"some" used (if two components each comprise 20-50% of total)
Other components = "little" used (if 10-20% of total)
"trace" used (if 10% of total)

Figure 1

LEGEND

Soil Profiles A-A, B-B, C-C



Boring Number

Ground Surface Elevation

Location of 2" O.D. split spoon sample, driven with 140 lb. hammer, 30 inch drop; numbers indicate blows per 6 inches unless noted otherwise.

*Denotes use of 300 lb. hammer in lieu of 140 lb. Hammer.

No recovery.

Cored obstruction in fill materials or boulder.

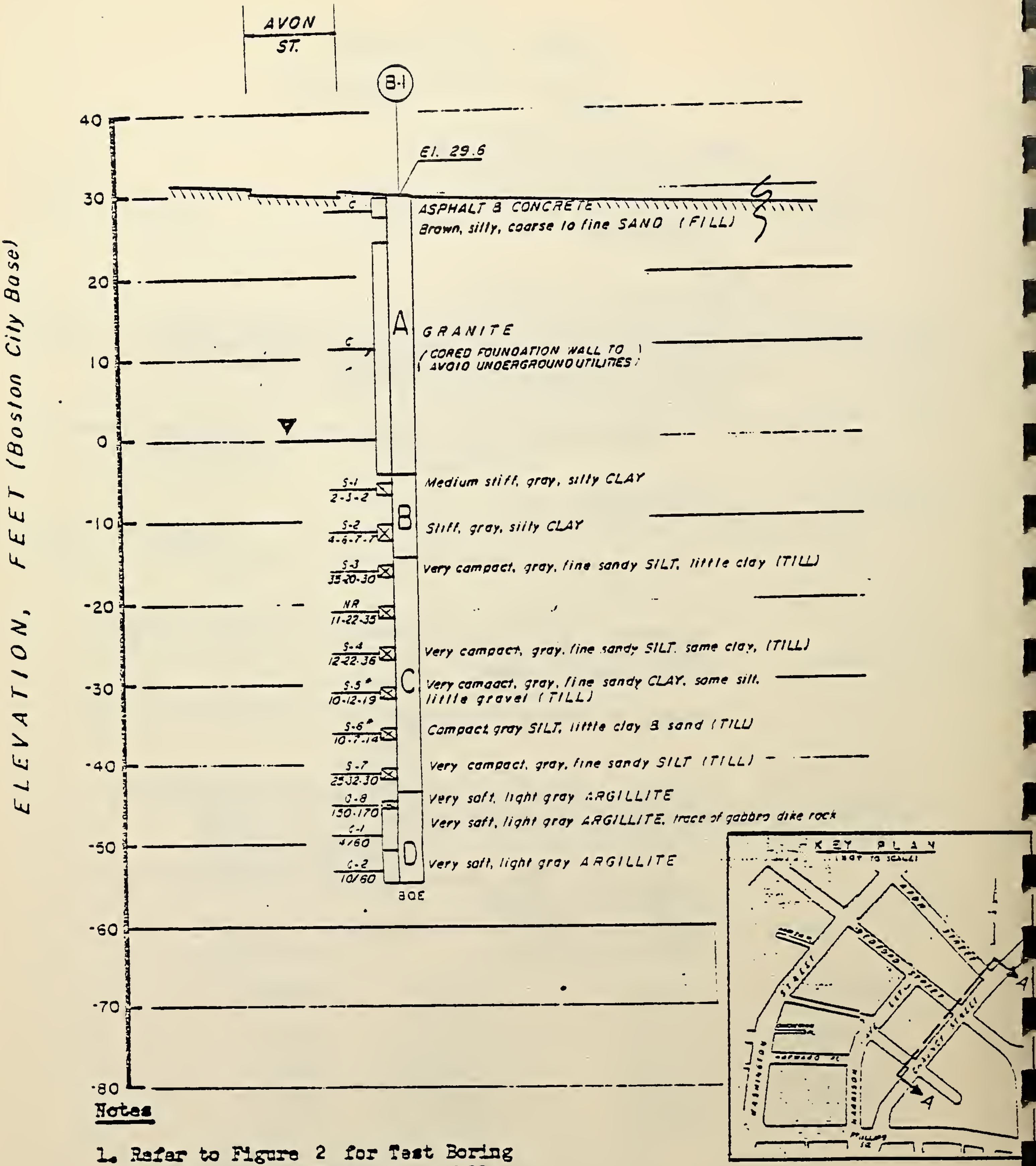
Location of 1-5/8" O.D. open end rod driven with 300 lb. hammer, 24 inch drop; numbers indicate blows per 6 inches unless otherwise noted.

Water level observed in boring upon completion of the hole.

Water level observed in observation well installed in or adjacent to completed borehole.

Location of 1-3/8" diameter rock core with core recovery 4" out of 60" drilled.

Bottom of exploration.


AVON ST.
B-1
El. 29.6
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
ELEVATION, FEET (Boston City Base)
C
ASPHALT & CONCRETE
Brown, silty, coarse to fine SAND (FILL)
A
GRANITE
(CORED FOUNDATION WALL TO AVOID UNDERGROUND UTILITIES)
C
S-1 2-3-2
Medium stiff, gray, silty CLAY
B
S-2 4-6-7-7
Stiff, gray, silty CLAY
S-3 35-20-30
Very compact, gray, fine sandy SILT, little clay (TILL)
NR 11-22-35
S-4 12-22-36
Very compact, gray, fine sandy SILT, some clay, (TILL)
C
S-5* 10-12-19
Very compact, gray, fine sandy CLAY, some silt, little gravel (TILL)
S-6* 10-7-14
Compact gray SILT, little clay & sand (TILL)
S-7 25-32-30
Very compact, gray, fine sandy SILT (TILL)
C-8 130-170
Very soft, light gray ARGILLITE
Very soft, light gray ARGILLITE, trace of gabbro dike rock
C-1 4/60
D
C-2 10/60
Very soft, light gray ARGILLITE
BOE
KEY PLAN
(NOT TO SCALE)
AVON STREET
BEDFORD STREET
STREET
CHAUNCY STREET
WASHINGTON
HAYWARD PL
HARRISON
PHILLIPS SQ
A
A

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

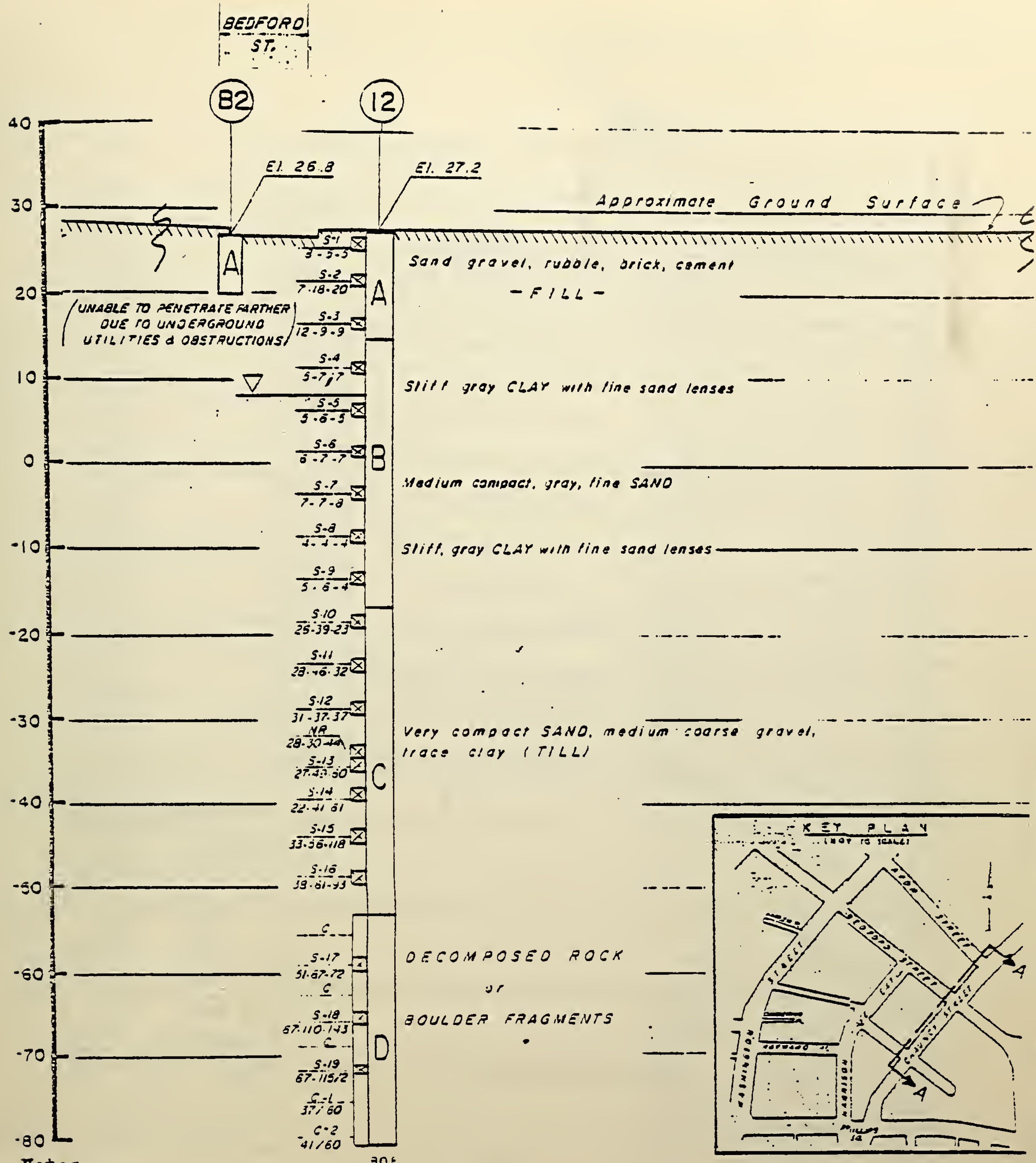
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE A-A (1)

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS



Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

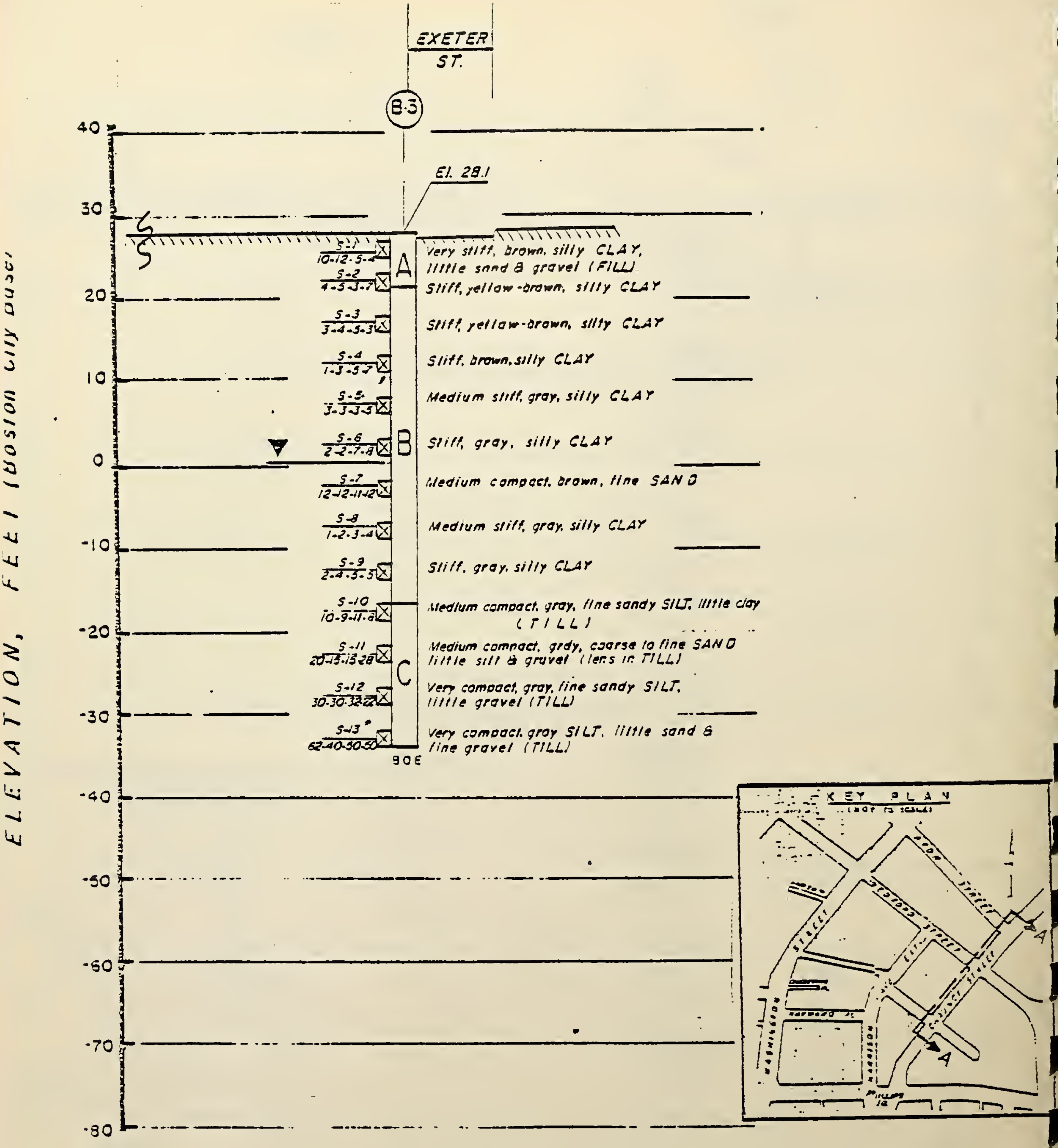
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE A-A(2)

MAY 1974


EXETER ST.
B-3
El. 28.1
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
ELEVATION, FEET (BOSTON CITY BASE
S-1 10-12-5-4
S-2 4-5-3-7
S-3 3-4-5-3
S-4 1-3-5-7
S-5 3-3-3-5
S-6 2-2-7-8
S-7 12-12-11-12
S-8 1-2-3-4
S-9 2-4-5-5
S-10 10-9-11-8
S-11 20-15-15-28
S-12 30-30-32-22
S-13* 62-40-50-50
A
B
C
BOE
Very stiff, brown, silty CLAY, little sand & gravel (FILL)
Stiff, yellow-brown, silty CLAY
Stiff, yellow-brown, silty CLAY
Stiff, brown, silty CLAY
Medium stiff, gray, silty CLAY
Stiff, gray, silty CLAY
Medium compact, brown, fine SAND
Medium stiff, gray, silty CLAY
Stiff, gray, silty CLAY
Medium compact, gray, fine sandy SILT, little clay (TILL)
Medium compact, gray, coarse to fine SAND little silt & gravel (lens in TILL)
Very compact, gray, fine sandy SILT, little gravel (TILL)
Very compact, gray SILT, little sand & fine gravel (TILL)
KEY PLAN
(NOT TO SCALE)
AVON STREET
BEDFORD STREET
STREET
CHAUNCY STREET
WASHINGTON
HARRISON
HAYWARD PL.
A
A

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

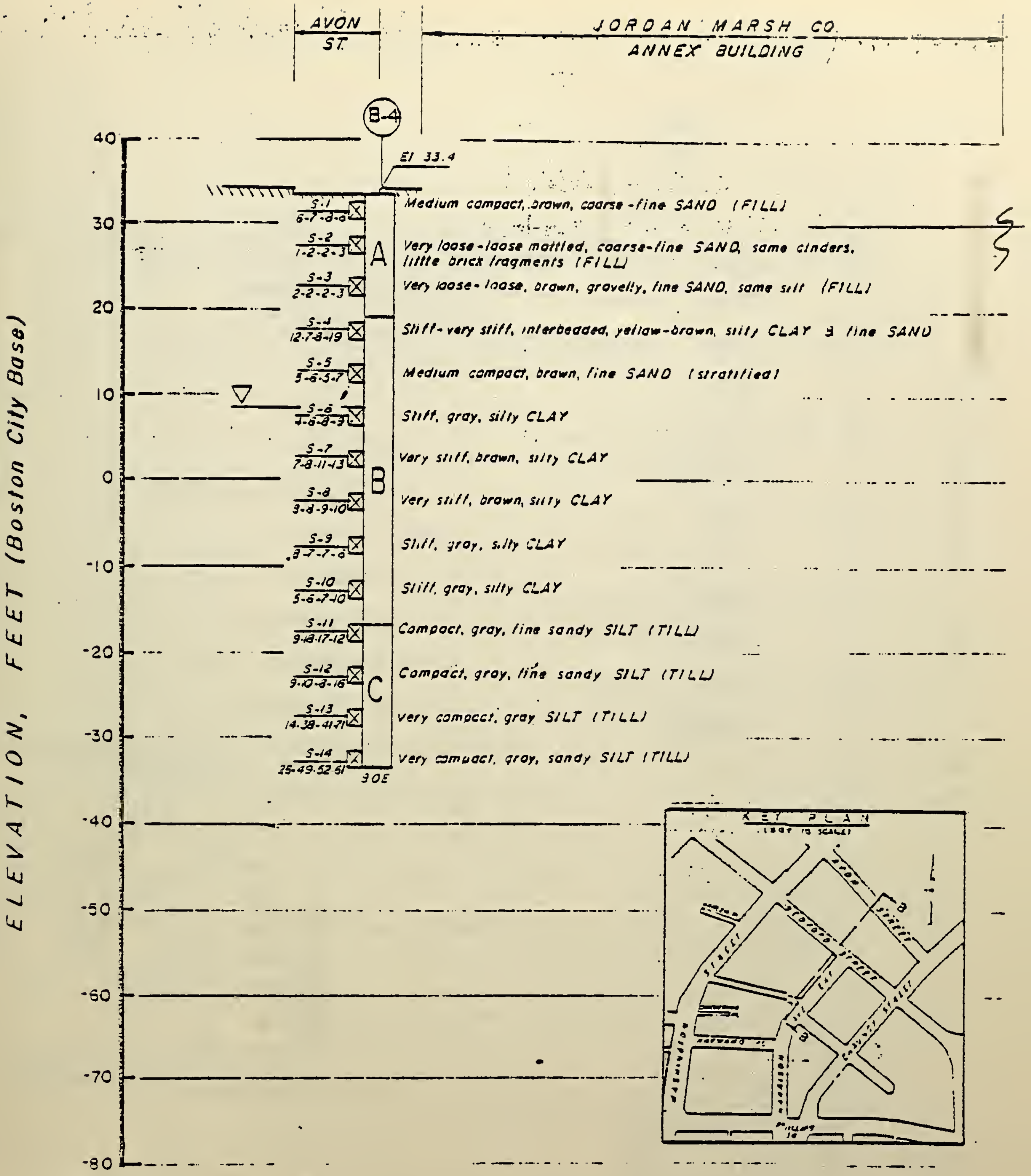
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE A-A (3

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS


AVON ST.
JORDAN MARSH CO.
ANNEX BUILDING
B-4
El 33.4
ELEVATION, FEET (Boston City Base)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
S-1
6-7-8-9
Medium compact, brown, coarse-fine SAND (FILL)
S-2
1-2-2-3
A
Very loose-loose mottled, coarse-fine SAND, same cinders, little brick fragments (FILL)
S-3
2-2-2-3
Very loose-loose, brown, gravelly, fine SAND, same silt (FILL)
S-4
12-7-8-19
Stiff-very stiff, interbedded, yellow-brown, silty CLAY & fine SAND
S-5
5-6-5-7
Medium compact, brown, fine SAND (stratified)
S-6
4-6-8-3
Stiff, gray, silty CLAY
S-7
7-8-11-13
Very stiff, brown, silty CLAY
B
S-8
9-8-9-10
Very stiff, brown, silty CLAY
S-9
8-7-7-6
Stiff, gray, silty CLAY
S-10
5-6-7-10
Stiff, gray, silty CLAY
S-11
9-18-17-12
Compact, gray, fine sandy SILT (TILL)
S-12
9-10-8-16
C
Compact, gray, fine sandy SILT (TILL)
S-13
14-38-41-71
very compact, gray SILT (TILL)
S-14
25-49-52-61
very compact, gray, sandy SILT (TILL)
30E
KEY PLAN
(NOT TO SCALE)
AVON STREET
STREET
B
B
Phillips Sq

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

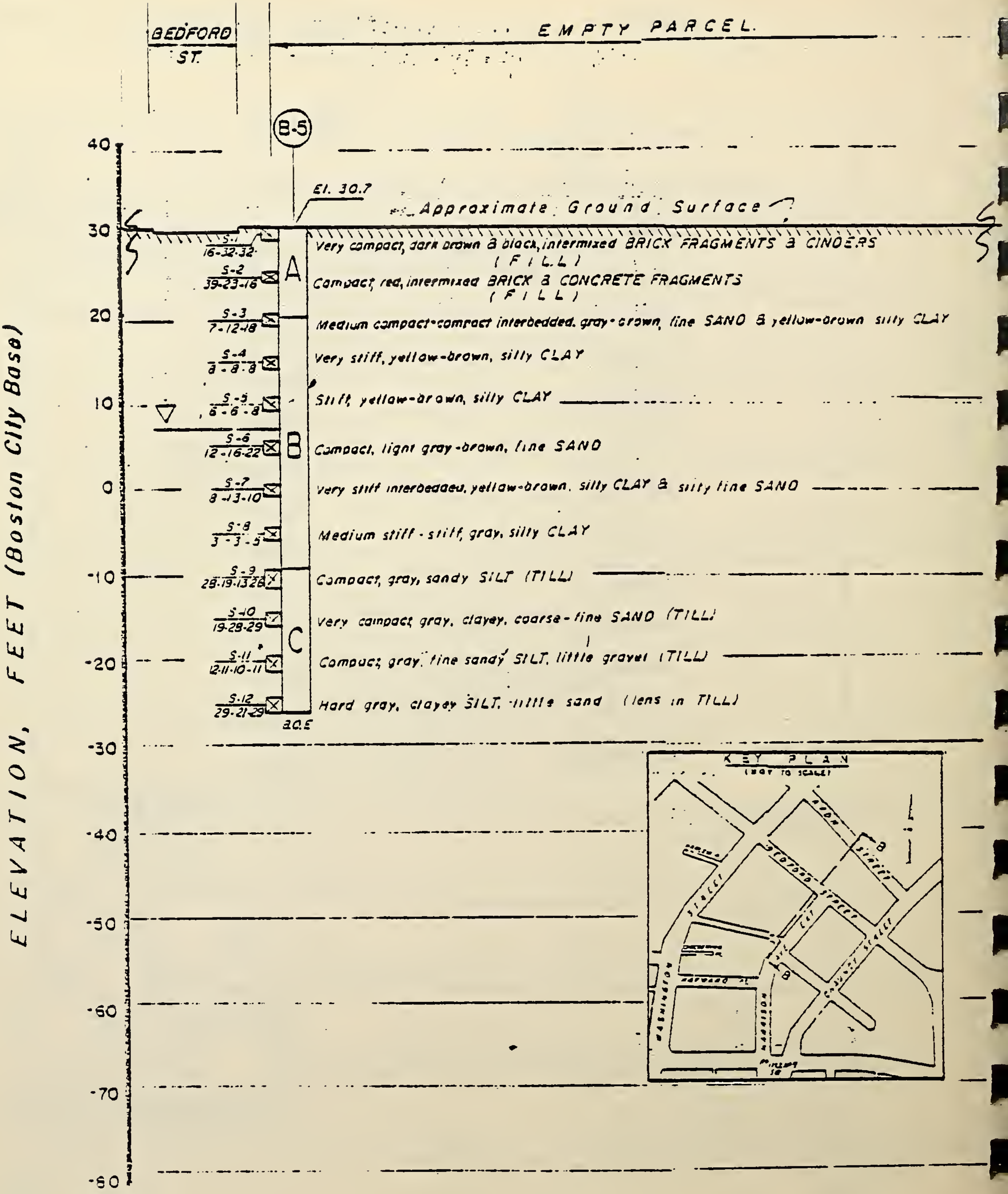
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE B-B(1)

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS


BEDFORD ST.
EMPTY PARCEL
B-5
El. 30.7
Approximate Ground Surface
ELEVATION, FEET (Boston City Base)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
S-1 16-32-32
S-2 39-23-16
S-3 7-12-18
S-4 8-8-8
S-5 6-6-8
S-6 12-16-22
S-7 8-13-10
S-8 3-3-5
S-9 28-19-13-28
S-10 19-28-29
S-11 12-11-10-11
S-12 29-21-29
A
B
C
B.O.E
Very compact, dark brown & black, intermixed BRICK FRAGMENTS & CINDERS (FILL)
Compact, red, intermixed BRICK & CONCRETE FRAGMENTS (FILL)
Medium compact-compact interbedded, gray-brown, fine SAND & yellow-brown silty CLAY
Very stiff, yellow-brown, silty CLAY
Stiff, yellow-brown, silty CLAY
Compact, light gray-brown, fine SAND
Very stiff interbedded, yellow-brown, silty CLAY & silty fine SAND
Medium stiff-stiff, gray, silty CLAY
Compact, gray, sandy SILT (TILL)
Very compact, gray, clayey, coarse-fine SAND (TILL)
Compact, gray, fine sandy SILT, little gravel (TILL)
Hard gray, clayey SILT, little sand (lens in TILL)
KEY PLAN
(NOT TO SCALE)
AVON STREET
BEDFORD STREET
CHAUNCY STREET
HAYWARD PL
WASHINGTON
HARRISON
B
B

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

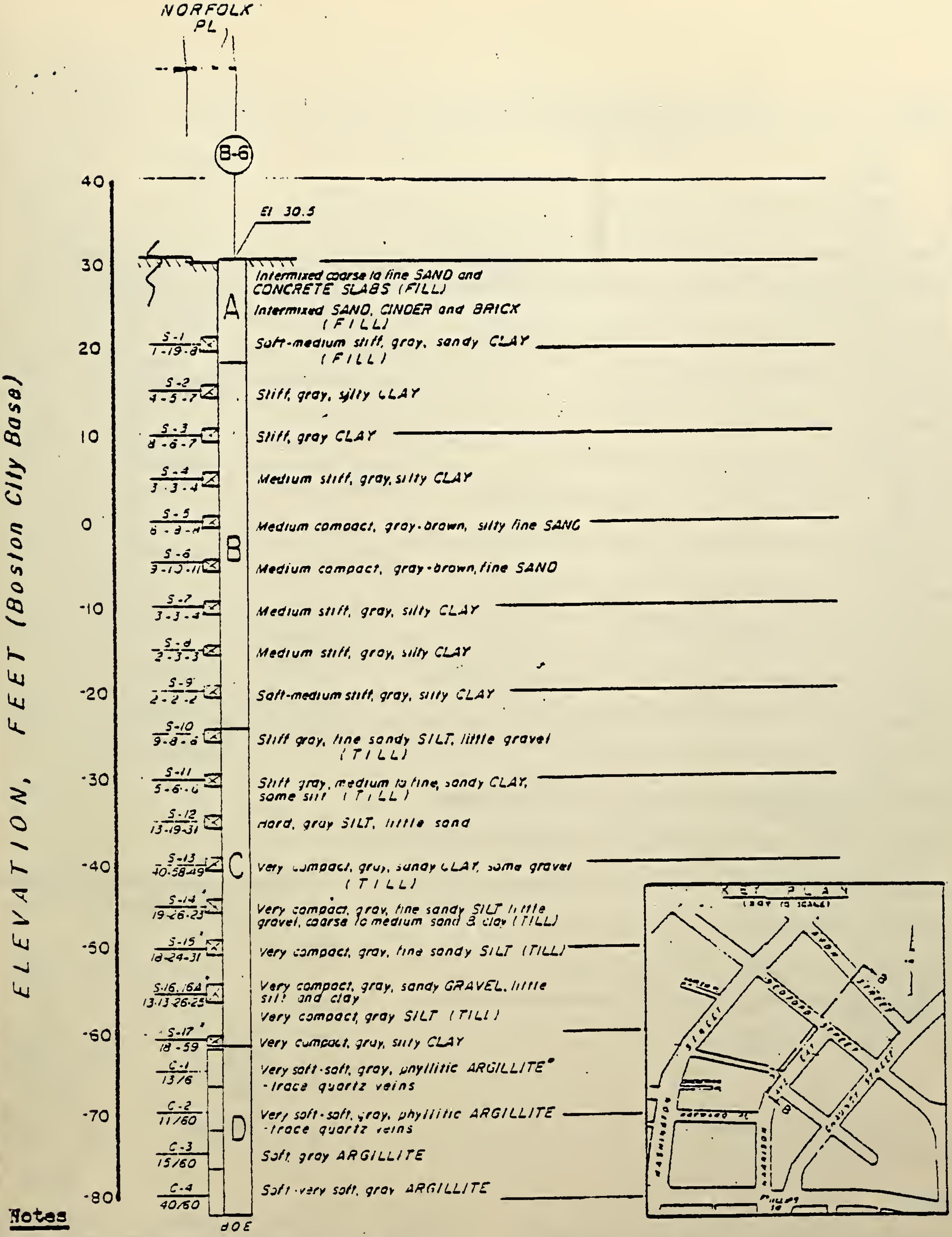
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE B-B(2)

HALEY & ALDRICH, INC.

MAY 1974


NORFOLK PL
B-6
El 30.5
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
ELEVATION, FEET (Boston City Base)
A
B
C
D
Intermixed coarse to fine SAND and CONCRETE SLABS (FILL)
Intermixed SAND, CINDER and BRICK (FILL)
S-1 1-19-8
Soft-medium stiff, gray, sandy CLAY (FILL)
S-2 4-5-7
Stiff, gray, silty CLAY
S-3 8-6-7
Stiff, gray CLAY
S-4 3-3-4
Medium stiff, gray, silty CLAY
S-5 6-8-4
Medium compact, gray-brown, silty fine SAND
S-6 9-10-11
Medium compact, gray-brown, fine SAND
S-7 3-3-4
Medium stiff, gray, silty CLAY
S-8 2-3-3
Medium stiff, gray, silty CLAY
S-9 2-2-2
Soft-medium stiff, gray, silty CLAY
S-10 9-8-8
Stiff gray, fine sandy SILT, little gravel (TILL)
S-11 5-6-6
Stiff gray, medium to fine, sandy CLAY, some silt (TILL)
S-12 13-19-31
Hard, gray SILT, little sand
S-13 40-58-49
Very compact, gray, sandy CLAY, some gravel (TILL)
S-14 19-26-23
Very compact, gray, fine sandy SILT little gravel, coarse to medium sand & clay (TILL)
S-15 18-24-31
Very compact, gray, fine sandy SILT (TILL)
S-16, 16A 13-13 26-25
Very compact, gray, sandy GRAVEL, little silt and clay
Very compact, gray SILT (TILL)
S-17 18-59
Very compact, gray, silty CLAY
C-1 13/6
Very soft-soft, gray, phyllitic ARGILLITE trace quartz veins
C-2 11/60
Very soft-soft, gray, phyllitic ARGILLITE trace quartz veins
C-3 15/60
Soft, gray ARGILLITE
C-4 40/60
Soft-very soft, gray ARGILLITE
BOE
KEY PLAN
(NOT TO SCALE)
B
B

Notes

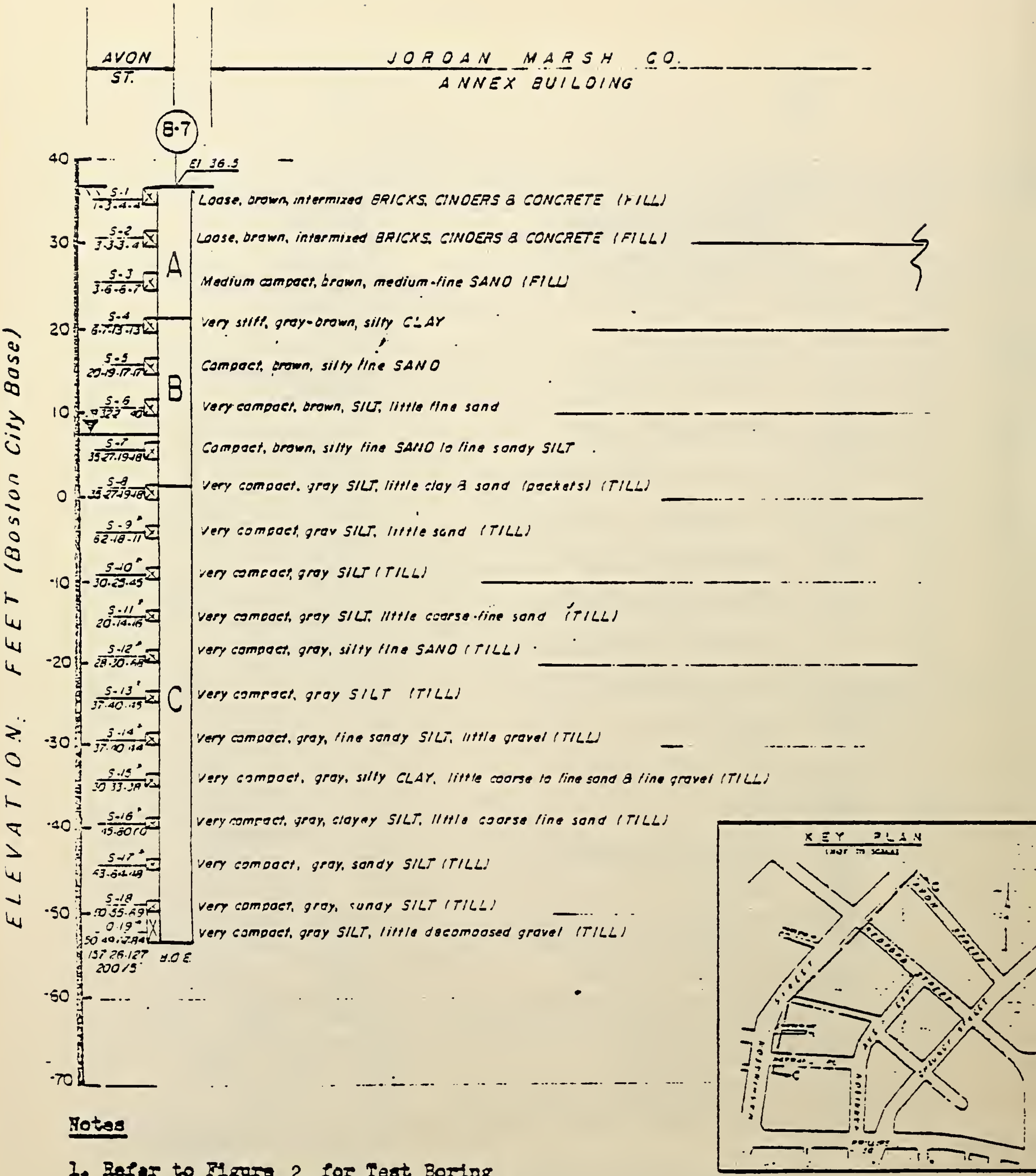
1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE B-B(3)

HALEY & ALDRICH, INC.


AVON ST.
JORDAN MARSH CO.
ANNEX BUILDING
B-7
El 36.5
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
ELEVATION: FEET (Boston City Base)
S-1 1-3-4-4
S-2 3-3-3-4
S-3 3-6-6-7
S-4 6-7-13-13
S-5 20-19-17-17
S-6 32 40
S-7 35-27-19-48
S-8 35-27-19-48
S-9 62-18-11
S-10 30-23-45
S-11 20-14-16
S-12 28-30-45
S-13 37-40-45
S-14 37-40-44
S-15 30-33-38
S-16 45-80/0
S-17 43-64-48
S-18 50-55-69
0-19 50-49-/2-84
137-26-127
200/5
B.O.E.
A
B
C
Loose, brown, intermixed BRICKS, CINDERS & CONCRETE (FILL)
Loose, brown, intermixed BRICKS, CINDERS & CONCRETE (FILL)
Medium compact, brown, medium-fine SAND (FILL)
Very stiff, gray-brown, silty CLAY
Compact, brown, silty fine SAND
Very compact, brown, SILT, little fine sand
Compact, brown, silty fine SAND to fine sandy SILT
Very compact, gray SILT, little clay & sand (pockets) (TILL)
Very compact, gray SILT, little sand (TILL)
Very compact, gray SILT (TILL)
Very compact, gray SILT, little coarse-fine sand (TILL)
Very compact, gray, silty fine SAND (TILL)
Very compact, gray SILT (TILL)
Very compact, gray, fine sandy SILT, little gravel (TILL)
Very compact, gray, silty CLAY, little coarse to fine sand & fine gravel (TILL)
Very compact, gray, clayey SILT, little coarse-fine sand (TILL)
Very compact, gray, sandy SILT (TILL)
Very compact, gray, sandy SILT (TILL)
Very compact, gray SILT, little decomposed gravel (TILL)
KEY PLAN
(NOT TO SCALE)
AVON STREET
WASHINGTON
C

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

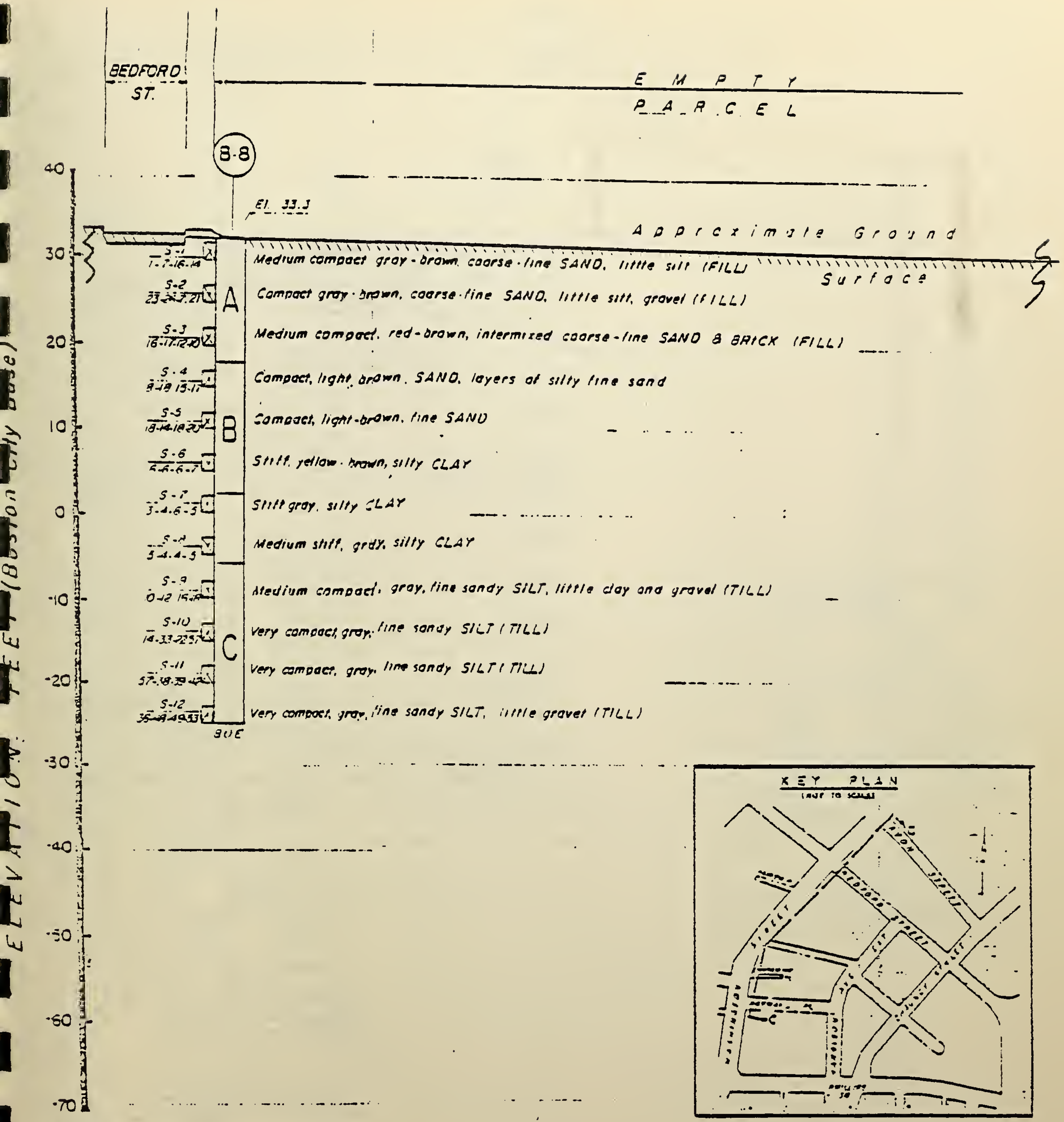
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE C-C(1)

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

MAY 1974


BEDFORD ST.
E M P T Y
P A R C E L
B-8
EL. 33.3
Approximate Ground Surface
ELEVATION: FEET (Boston City Base)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
S-1 1-7-16-14
S-2 23-23-7-21
S-3 16-17-12-10
S-4 9-19-15-17
S-5 18-14-18-20
S-6 5-6-6-7
S-7 3-4-6-5
S-8 3-4-4-5
S-9 0-12-15
S-10 14-33-22-57
S-11 57-58-39-42
S-12 35-48-49-53
A
B
C
BOE
Medium compact gray-brown, coarse-fine SAND, little silt (FILL)
Compact gray-brown, coarse-fine SAND, little silt, gravel (FILL)
Medium compact, red-brown, intermixed coarse-fine SAND & BRICK (FILL)
Compact, light brown, SAND, layers of silty fine sand
Compact, light-brown, fine SAND
Stiff, yellow-brown, silty CLAY
Stiff gray, silty CLAY
Medium stiff, gray, silty CLAY
Medium compact, gray, fine sandy SILT, little clay and gravel (TILL)
Very compact, gray, fine sandy SILT (TILL)
Very compact, gray, fine sandy SILT (TILL)
Very compact, gray, fine sandy SILT, little gravel (TILL)
KEY PLAN
(NOT TO SCALE)
AVON STREET
BEDFORD STREET
STREET
WASHINGTON
C

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

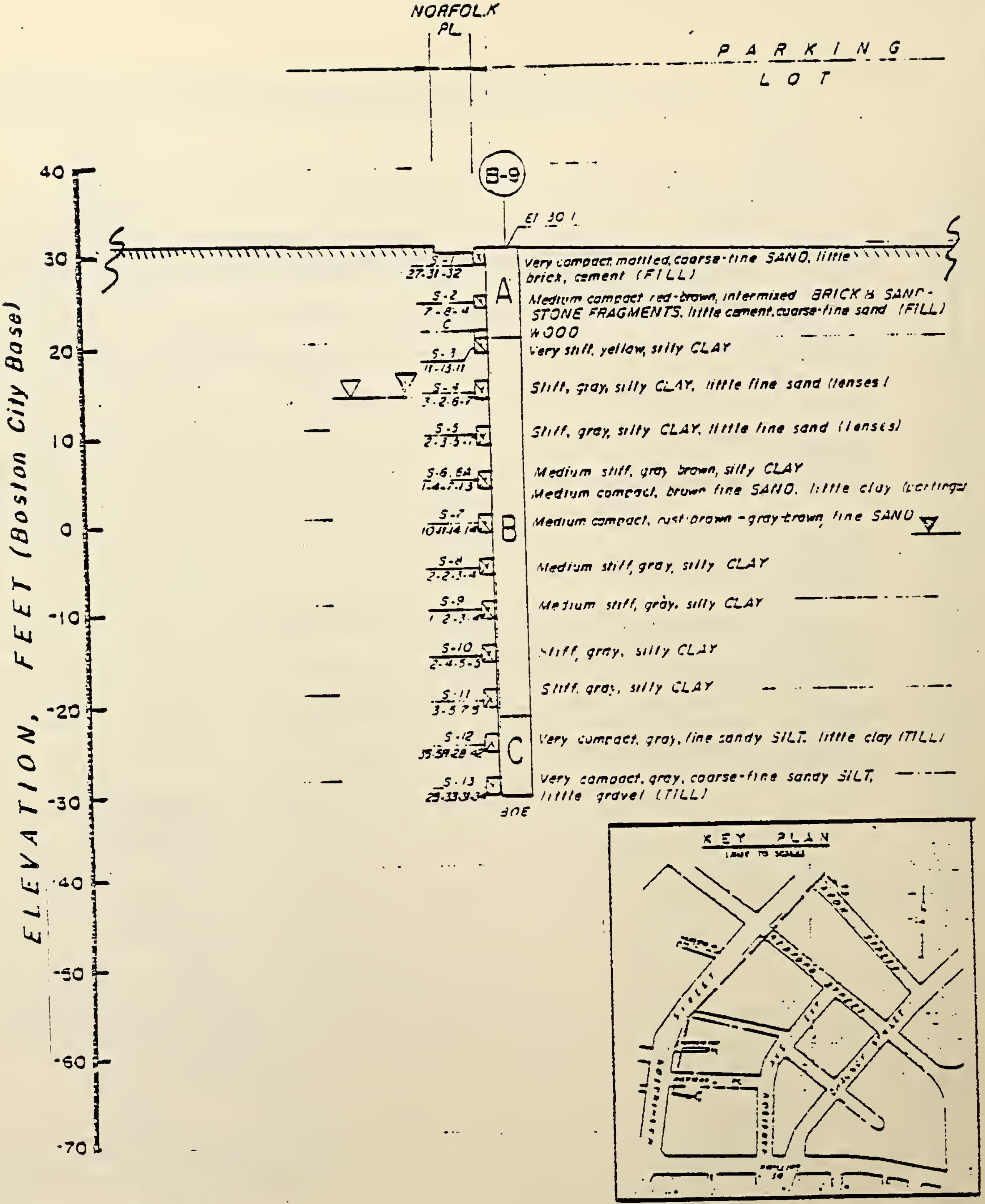
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE C-C(2)

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS


NORFOLK PL
PARKING LOT
B-9
El 30 !
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
ELEVATION, FEET (Boston City Base)
S-1 27-31-32
S-2 7-8-4
C
S-3 11-13-11
S-4 3-2-6-7
S-5 2-3-3-
S-6, 6A 1-4-7-13
S-7 10-11-14 14
S-8 2-2-3-4
S-9 1 2-3-4
S-10 2-4-5-5
S-11 3-5 7 9
S-12 35-59-28 42
S-13 25-33-33-34
A
B
C
BOE
Very compact mottled, coarse-fine SAND, little brick, cement (FILL)
Medium compact red-brown, intermixed BRICK & SAND-STONE FRAGMENTS, little cement, coarse-fine sand (FILL)
WOOD
Very stiff, yellow, silty CLAY
Stiff, gray, silty CLAY, little fine sand (lenses)
Stiff, gray, silty CLAY, little fine sand (lenses)
Medium stiff, gray brown, silty CLAY
Medium compact, brown fine SAND, little clay (partings)
Medium compact, rust-brown - gray-brown fine SAND
Medium stiff, gray, silty CLAY
Medium stiff, gray, silty CLAY
Stiff, gray, silty CLAY
Stiff, gray, silty CLAY
Very compact, gray, fine sandy SILT, little clay (TILL)
Very compact, gray, coarse-fine sandy SILT, little gravel (TILL)
KEY PLAN
(NOT TO SCALE)

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

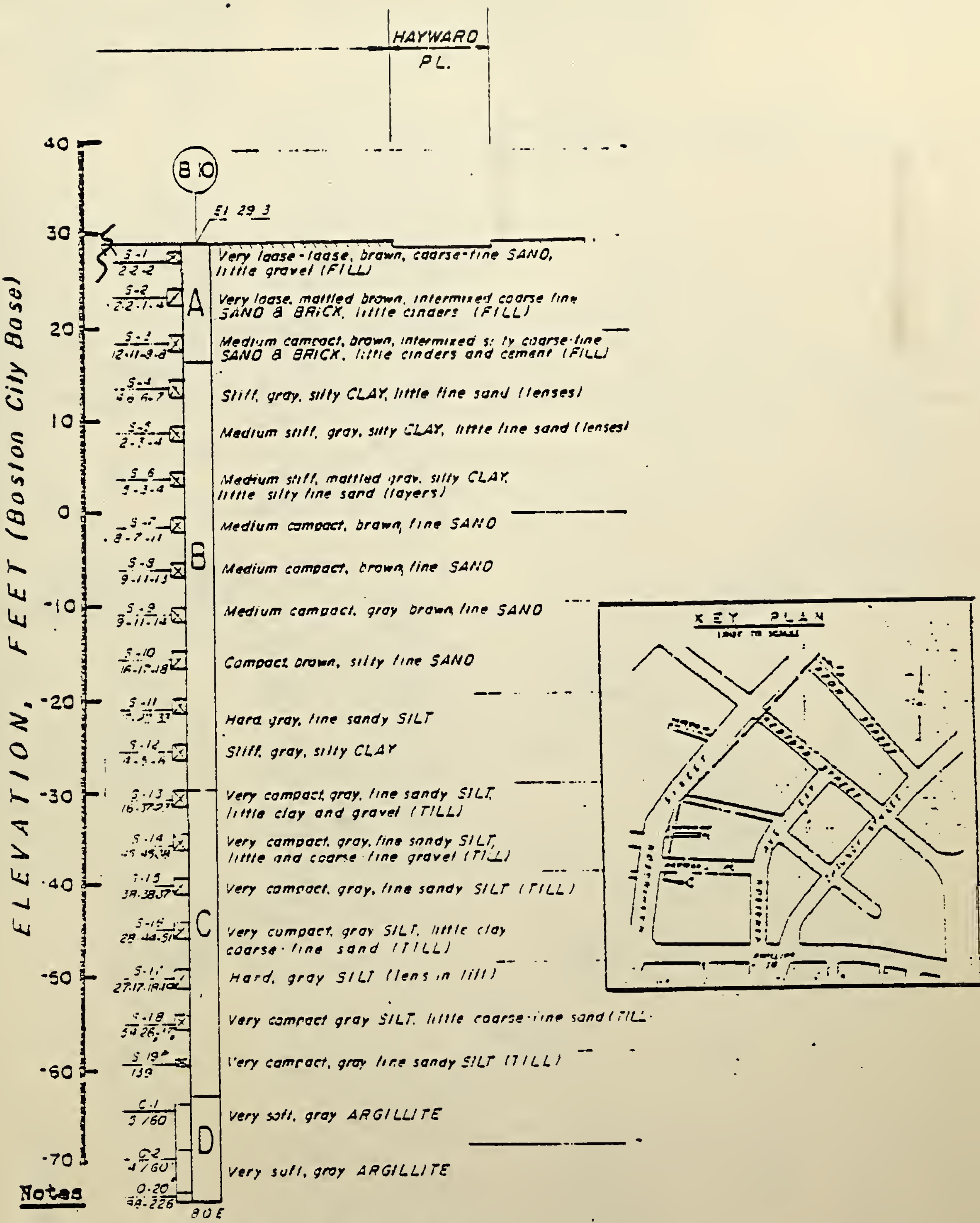
SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE C-C(3)

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS


HAYWARD PL.
ELEVATION, FEET (Boston City Base)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
B10
El 29.3
S-1 2-2-2
Very loose-loose, brown, coarse-fine SAND, little gravel (FILL)
S-2 2-2-1-4
A
Very loose, mottled brown, intermixed coarse-fine SAND & BRICK, little cinders (FILL)
S-3 12-11-9-8
Medium compact, brown, intermixed silty coarse-fine SAND & BRICK, little cinders and cement (FILL)
S-4 4-9-6-7
Stiff, gray, silty CLAY, little fine sand (lenses)
S-5 2-3-4
Medium stiff, gray, silty CLAY, little fine sand (lenses)
S-6 3-3-4
Medium stiff, mottled gray, silty CLAY, little silty fine sand (layers)
S-7 8-7-11
Medium compact, brown, fine SAND
S-8 9-11-13
B
Medium compact, brown, fine SAND
S-9 9-11-14
Medium compact, gray brown, fine SAND
S-10 16-17-18
Compact brown, silty fine SAND
S-11
Hard gray, fine sandy SILT
S-12 4-5-6
Stiff, gray, silty CLAY
S-13 16-17-27
Very compact, gray, fine sandy SILT, little clay and gravel (TILL)
S-14 45-45-34
Very compact, gray, fine sandy SILT, little and coarse-fine gravel (TILL)
S-15 39-38-37
Very compact, gray, fine sandy SILT (TILL)
S-16 29-44-51
C
Very compact, gray SILT, little clay coarse-fine sand (TILL)
S-17 27-17-18-10
Hard, gray SILT (lens in till)
S-18 54-26-17
Very compact gray SILT, little coarse-fine sand (TILL)
S-19 139
Very compact, gray fine sandy SILT (TILL)
C-1 5/60
Very soft, gray ARGILLITE
D
C-2 4/60
0-20 38-226
Very soft, gray ARGILLITE
BOE
KEY PLAN
(NOT TO SCALE)

Notes

1. Refer to Figure 2 for Test Boring and Groundwater Observation Well Locations.
2. Refer to Figure 1 for Legend.
3. Refer to Table 3 for Major Subsurface Strata and Notes.

SCALE: 1" = 32' Horiz.
1" = 16' Vert.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

SOIL PROFILE C-C(4)

MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

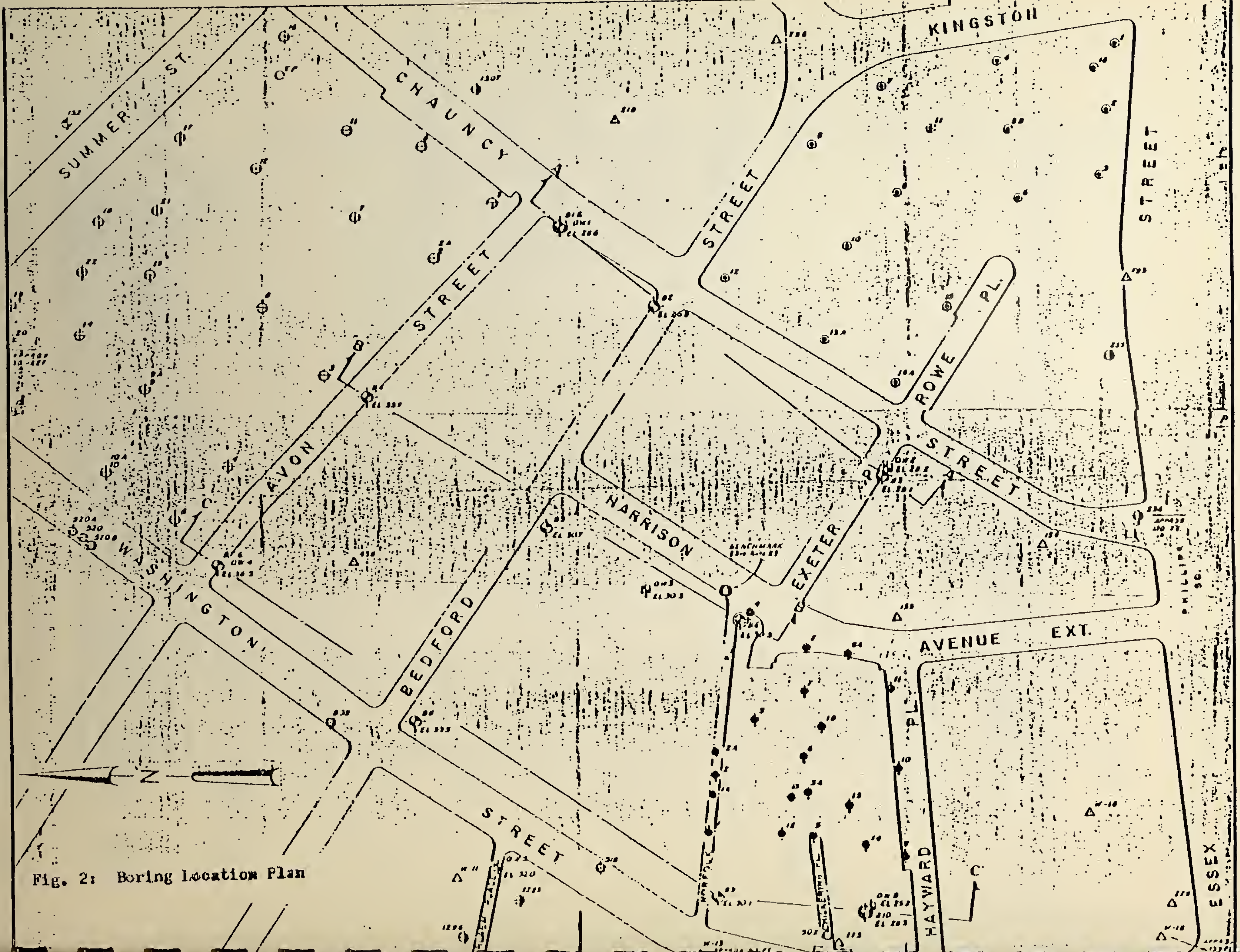


Fig. 2: Boring Location Plan

LEGEND

PREVIOUS BORINGS

SOURCE NUMBER	SYMBOL	
1	⊕	Borings made for Jordan Marsh Company and taken from Plan No. S-1 entitled "Soil Borings and Test Pit", by Perry Shaw and Hepburn, Architects, Boston, Mass.; latest revision dated 17 November 1955.
2	⊖ 235	Borings published in Journal of the Boston Society of Civil Engineers, July - October 1969.
3	△ 790	Borings published in Journal of the Boston Society of Civil Engineers, October 1949.
4	⊖ 502	Borings made for MBTA "Washington Street Tunnel Section 4"; shown on MBTA Sheets 6966 B2-B1, B2-B2, B2-B3; borings made prior to 1905.
5	● 8	Borings obtained from files of U.S. Geological Survey and made for Hayward Place Parking Facility; date unknown.
6	◉ 2	Borings made for Boston Edison Company by C.L. Guild Drilling and Boring Co., Inc. Dec. 1972-Feb. 1973; taken from drawing furnished by Boston Edison Co. to C.L. Guild.

PILOT BORINGS

87 ⊕ OW 4 EL 36.5 — 2½-inch diameter drive sample test boring in earth.

O.W. 4 - Groundwater observation well installed in completed boring.

El. 36.5 - Elevation at ground surface, Boston City Base.

81 ⊕ — 2½-inch diameter drive sample test boring with 1-7/8-inch diameter 'BX' rock core.

OW 2 ■ EL 28.2 — 1½-inch diameter groundwater observation well installed in 3-inch diameter borehole.

El. 28.2 - Elevation at ground surface, Boston City Base.

"A" └ - — - ┘ "A" — Location of soil profiles as shown on Figures 3, 4 & 5.

● — Assumed benchmark (See Note 2).

NOTES

1. Pilot borings made by C.L. Guild Drilling & Boring Co., Inc., Avon, Massachusetts, May 1974.
2. Boring locations and ground surface elevations by Haley & Aldrich, Inc. Benchmark used was electric manhole rim (El. 29.27) at intersection of Norfolk Place and Harrison Ave. Extension. Elevation of rim taken from "Preliminary Plan Showing Building Corners and Utilities, Boston, Mass." by William S. Crocker, Inc., January 2, 1974.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

BORING LOCATION PLAN
PILOT PROGRAM

Fig. 2a MAY 1974

HALEY & ALDRICH, INC.

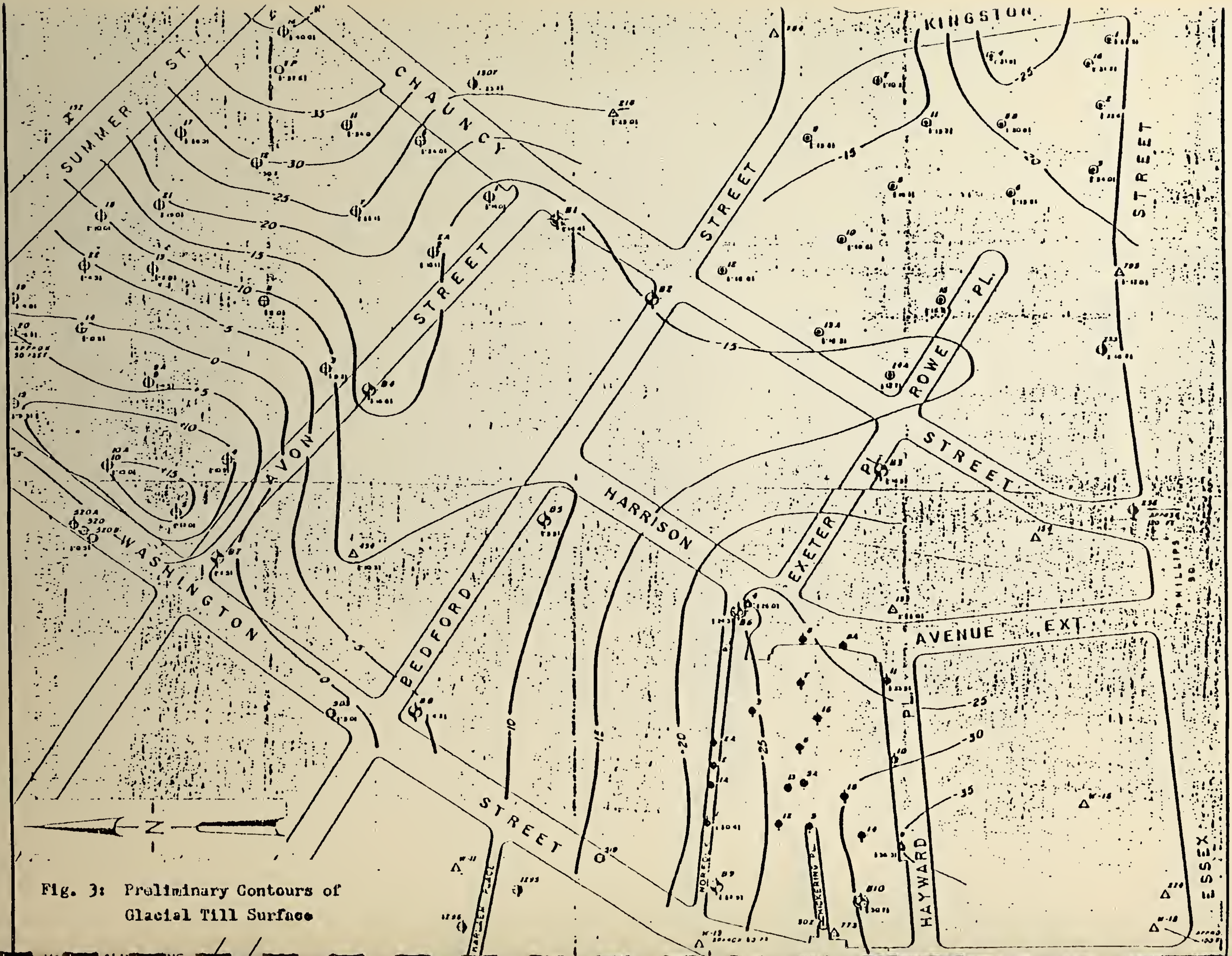


Fig. 3: Preliminary Contours of Glacial Till Surface

LEGEND

SOURCE NUMBER	SYMBOL	
1	⊕ 1	Borings made for Jordan Marsh Company and taken from Plan No. S-1 entitled "Soil Borings and Test Pit", by Perry Shaw and Hepburn, Architects, Boston, Mass.; latest revision dated 17 November 1955.
2	⊕ 235	Borings published in Journal of the Boston Society of Civil Engineers, July - October 1969.
3	△ 790	Borings published in Journal of the Boston Society of Civil Engineers, October 1949.
4	⊕ 502	Borings made for MBTA "Washington Street Tunnel Section 4"; shown on MBTA Sheets 6966 B2-81, B2-82, B2-83; borings made prior to 1905.
5	⊕ 8	Borings obtained from files of U.S. Geological Survey and made for Hayward Place Parking Facility; date unknown.
6	◎ 2	Borings made for Boston Edison Company by C.L. Guild Drilling and Boring Co., Inc. Dec. 1972-Feb. 1973; taken from drawing furnished by Boston Edison Co. to C.L. Guild.
	⊕ 87	2½-inch diameter drive sample test boring in earth.
	⊕ 81	2½-inch diameter drive sample test boring with 1-3/8-inch diameter (BX) rock core.
	(-15.5)	Elevation of glacial till at test boring, Boston City Base.
	-20-	Elevation contour of glacial till surface, Boston City Base.

NOTE

1. Elevation contours of glacial till surface have been interpreted from available test boring logs and are to be considered as necessary interpolations between borings which may not agree with field conditions.

LAFAYETTE PLACE
BOSTON, MASSACHUSETTS

PRELIMINARY CONTOURS OF GLACIAL TILL SURFACE

Fig. 3a MAY 1974

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

BOSTON TRANSIT AND TRAFFIC IMPROVEMENT PROGRAM[1]

The Boston Transit and Traffic Improvement Program will reallocate scarce street space to serve more rationally the needs of pedestrians, transit services, goods movement, taxis and private autos. The main feature of the project is a new distribution of the total street right-of-way into various elements including sidewalks, open space, bus stops, taxi stands, loading zones, parking and travel lanes.

Part of Boston's charm and character is its narrow and crooked streets, which provide a human scale environment in the downtown, yet also pose a challenge to provide a circulation system which will meet all the needs of pedestrians, trucks, buses, taxis and cars. Currently these modes compete for space and impede the smooth operation of each of them. The Transit and Traffic Improvement Program will improve circulation and new transit service within the heart of the downtown. This workable new system will be accompanied by design amenities which will further improve the downtown environment, thereby attracing new shoppers and strengthening the retail area.

1. PROJECT LOCATION AND CIRCULATION

The TTIP is located within the center of downtown. The area is bounded to the north by State/Court Streets, to the east by the Central Artery, to the south by Stuart and Kneeland Streets and to the west by Tremont Street. (See Figure 1)

The TTIP has three basic components: 1.) new circulation systems for buses, pedestrians, cars, taxis and delivery trucks 2.) physical reconstruction of Winter, Summer and Washington Streets to improve the pedestrian environment and 3.) special one year programs to subsidize increased bus operations, provide special maintenance and enforcement efforts, conduct a full time promotion effort, and evaluate the success of the project at the end of the year.

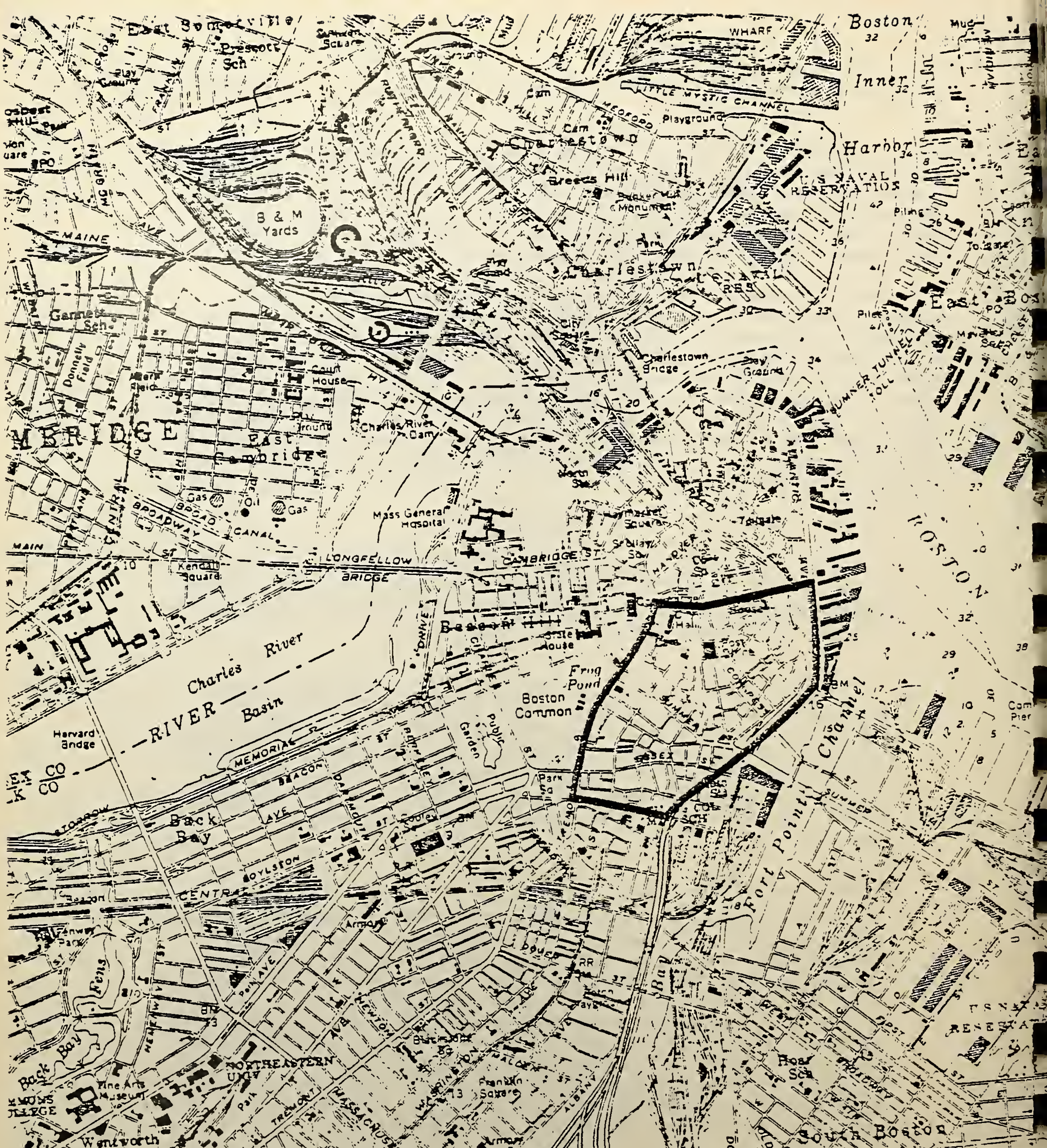
Transit Circulation

The proposed transit element of the TTIP includes both physical and operational improvements. The operational changes include revised route patterns for both local and express bus service. (See Figure 2.) The proposed local bus routes from the south will enter the project area via northbound Washington Street, turn right on Milk then southbound on Devonshire, Franklin and Chauncy/Arch to Bedford. From there, buses will return to Washington and exit the area heading south. The proposed local bus routes from the north will enter the area via southbound Devonshire, Franklin, Chauncy/Arch, right on Bedford, right on Washington, right on Milk, and exit via Post Office Square and northbound Congress Street.

The express routes will enter the area northbound on South Street to a specially marked loop on Federal, Franklin, Arch, and Summer Streets and exit the area southbound on the surface artery.

---

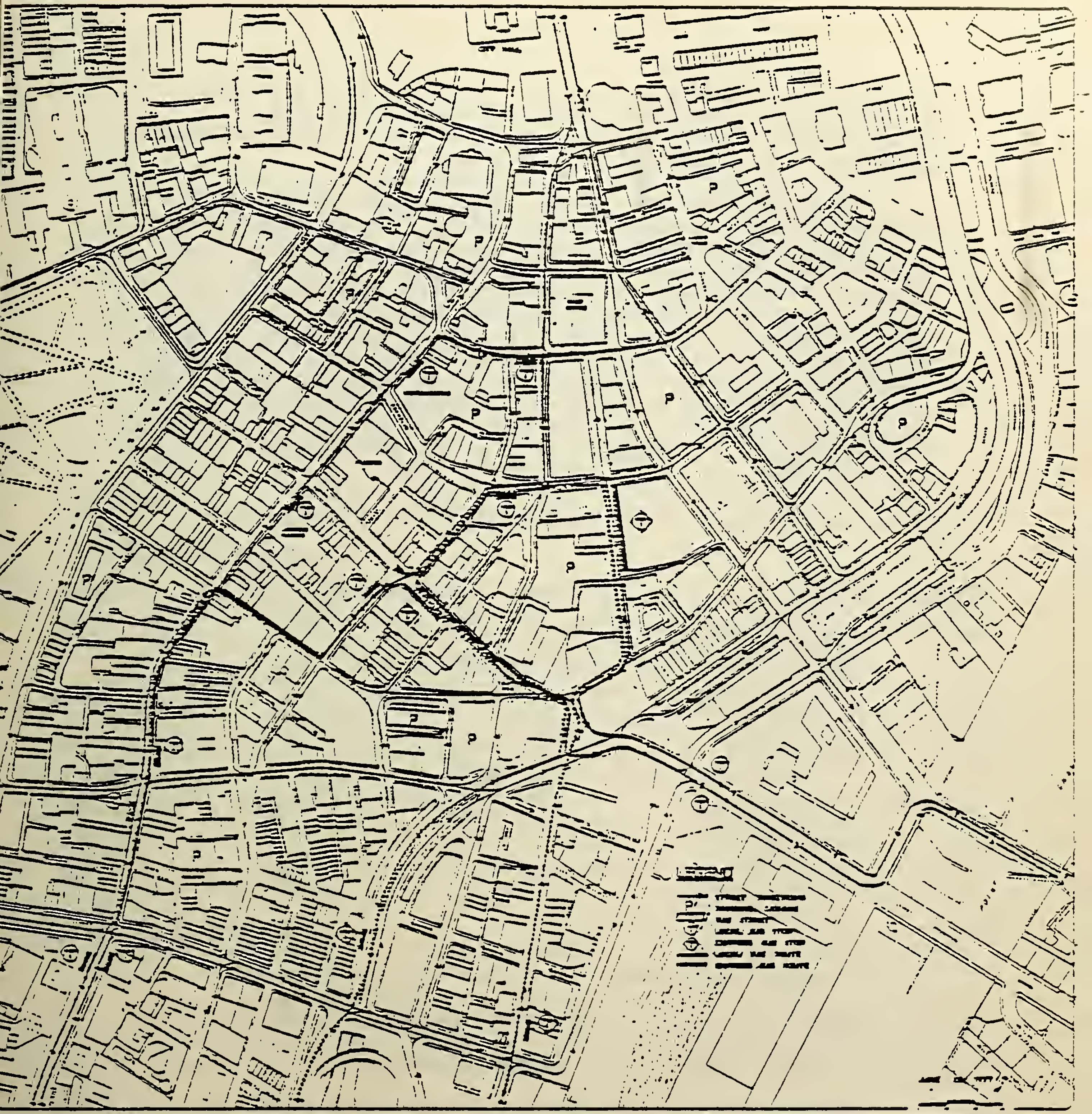
[1] **Source:** Boston Redevelopment Authority, **Transit and Traffic Improvement Program - Final Demonstration Grant Application**, Boston, March, 1978



TRANSIT AND TRAFFIC
IMPROVEMENT PROGRAM

TTIP PROJECT AREA

1



TRANSIT AND TRAFFIC IMPROVEMENT PROGRAM

BUS SERVICE

In addition, one other local bus route, which currently terminates at South Station, will enter the express bus loop from Summer Street, turning right on High to Federal, and will exit the loop by continuing on Summer Street to South Boston.

To accommodate these revised routes, special transit priority systems are also proposed. A combination of exclusive transitways and contra/flow bus lanes will permit buses to operate primarily on traffic-free streets, and to serve the heart of the retail core without the interference from present traffic. Washington Street between Bedford and Milk will be predominately transit, with limited delivery access. A special exclusive bus lane will be constructed on the south side of a widened Bedford Street. Contra-flow bus lanes are proposed for Milk Street eastbound, Chauncy/Arch Streets southbound, and Washington Street southbound from Bedford. These exclusive bus lanes will be self-enforcing. Other parts of the transit loop will be protected from other traffic by physical barriers.

The following buses will be running into the TTIP project area.

Route #	Origin	Present terminus	Existing Two-Way Ridership	% Downtown
11	City Point South Boston	Kneeland and Washington	3296	77%
43	Egleston Square	Park and Tremont	3746	66%
49	Northampton	Essex and Washington	252	86%
92	Sullivan Square (via Main St.)	Haymarket	1218	58%
93	Sullivan Square (via Bunker Hill)	Haymarket	3252	54%
7	City Point South Boston (Via Summer)	South Station	1582	72%
300	Riverside	Summer and Chauncy	3600	100%
301	Brighton Center	Summer and Chauncy	1850	100%
304	Watertown	Summer and Chauncy	4350	100%
305	Waltham	Summer and Chauncy	1200	100%

Pedestrian System

. The plan provides increased space for pedestrians on all the more congested shopping streets, as shown in Figure 3 with full pedestrianization of Winter Street and of Summer Street from Washington to Hawley. Sidewalk widening is proposed for Washington Street from Summer to Milk, and on Franklin from Arch to Washington Street. The Boston Five Park will be extended across what is now School Street. State House Park will strengthen the pedestrian connection between the Transit and Traffic Improvement Project and Government Center, and the Quincy Markets. . The plan proposes a series of combined pedestrian and transit improvements. The most congested segment of Washington Street will become a pedestrian/transitway. The creation of a pedestrian area on Winter Street will provide an excellent link from the retail core to the Boston Common, a major downtown resource, and to the Park Street Rapid Transit Station, one of the principal stations on the Green Line and a major generator of pedestrian trips within the CBD.

Goods Circulation

Goods access will occur on the regular auto streets as well as on certain street segments which are closed to autos. As shown in Figure 4, trucks will have all day use of two routes: 1) Hawley Street southbound to Summer Street eastbound: and 2) Washington Street northbound from Bedford/West Streets to westbound Temple Street. Trucks will be allowed before 11 a.m. only on Washington Street between Temple and Milk Streets, eastbound on Winter Street, and on Franklin/Bromfield from Hawley to Province Streets. The above streets will also be open after 2 p.m. to special goods haulers which include armored express, U.S. Mail, newspaper deliveries, air freight forwarders and parcel deliveries.

The loading zones needed to accommodate peak demand are identified in Figure 4.

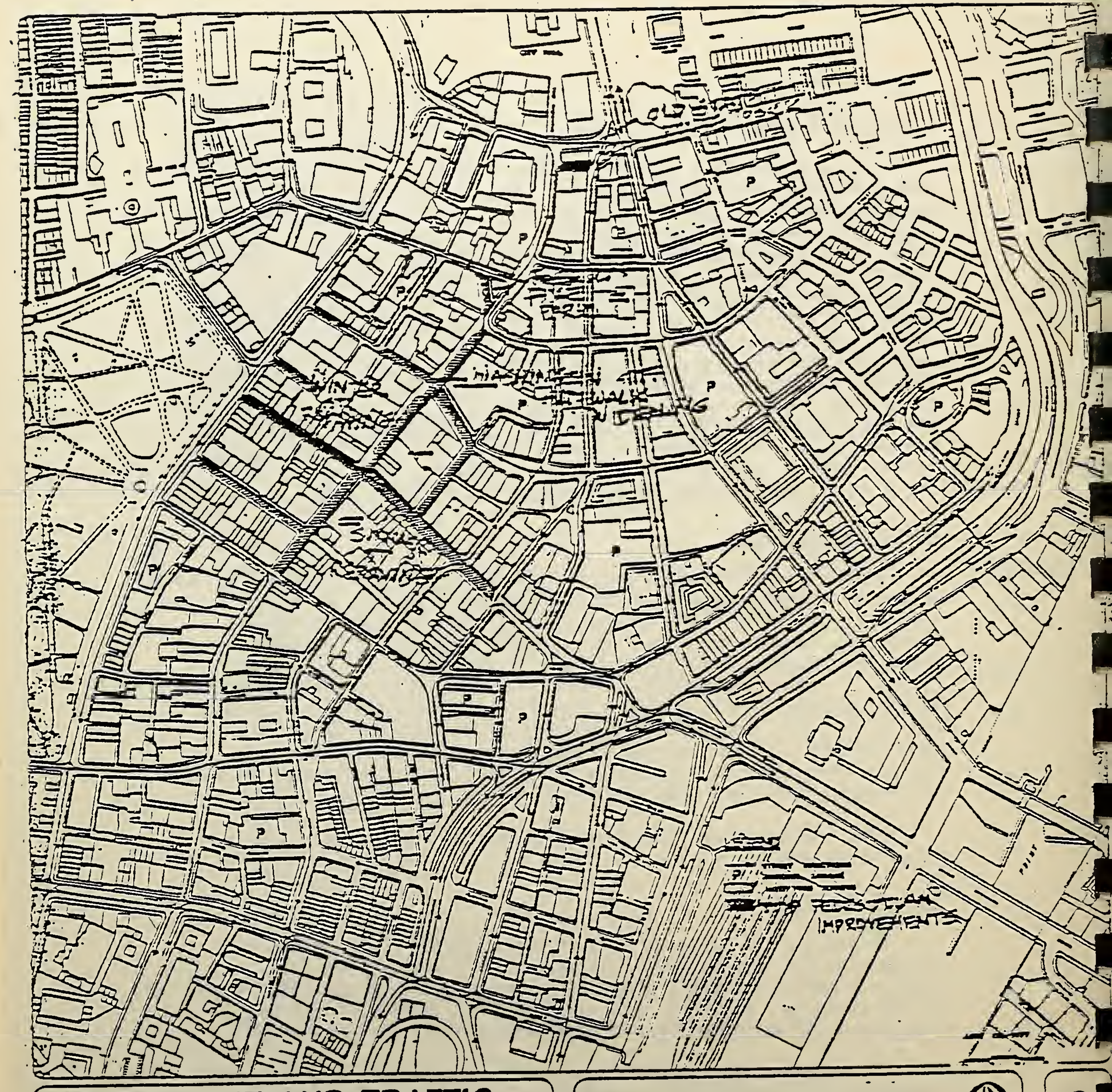
Taxi Circulation

In addition to using all auto streets, taxis will be allowed to use Franklin and Bromfield Streets from Hawley to Province, Hawley Street and Temple Place for access to cab stands. (Figure 5) In the evenings, taxis will also be able to use Winter Street and Washington Street from Temple to Bromfield/Franklin.

The location and number of taxi stands has been improved and increased. Of particular importance are the two 6-cab stands on Franklin and Summer Streets, and the two smaller stands near the corner of Washington and Temple.

Auto Circulation

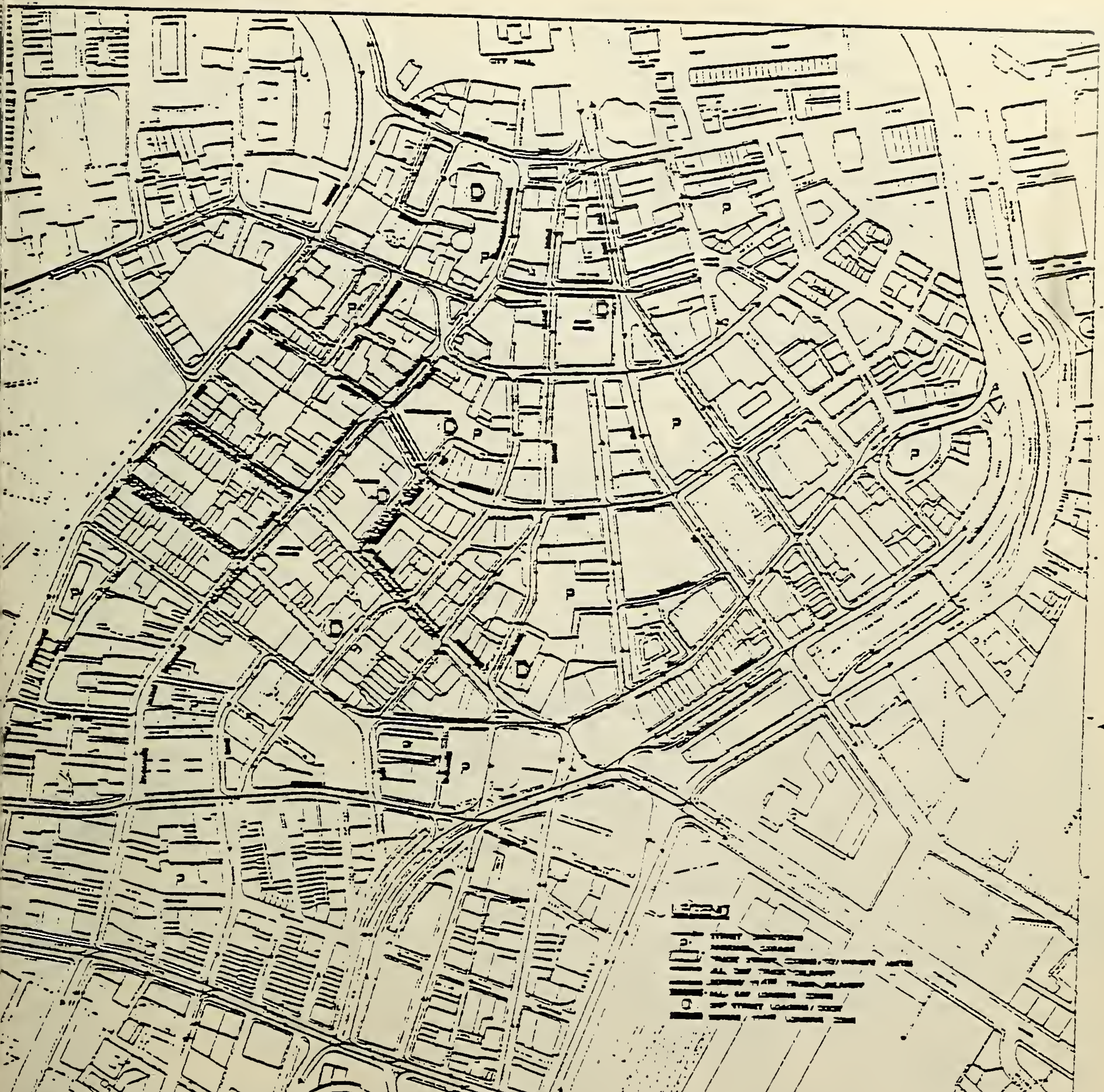
Simplification of the existing maze-like pattern of traffic circulation within the area was identified as the key to reducing the impact of auto traffic on the area and improving conditions for



TRANSIT AND TRAFFIC
IMPROVEMENT PROGRAM

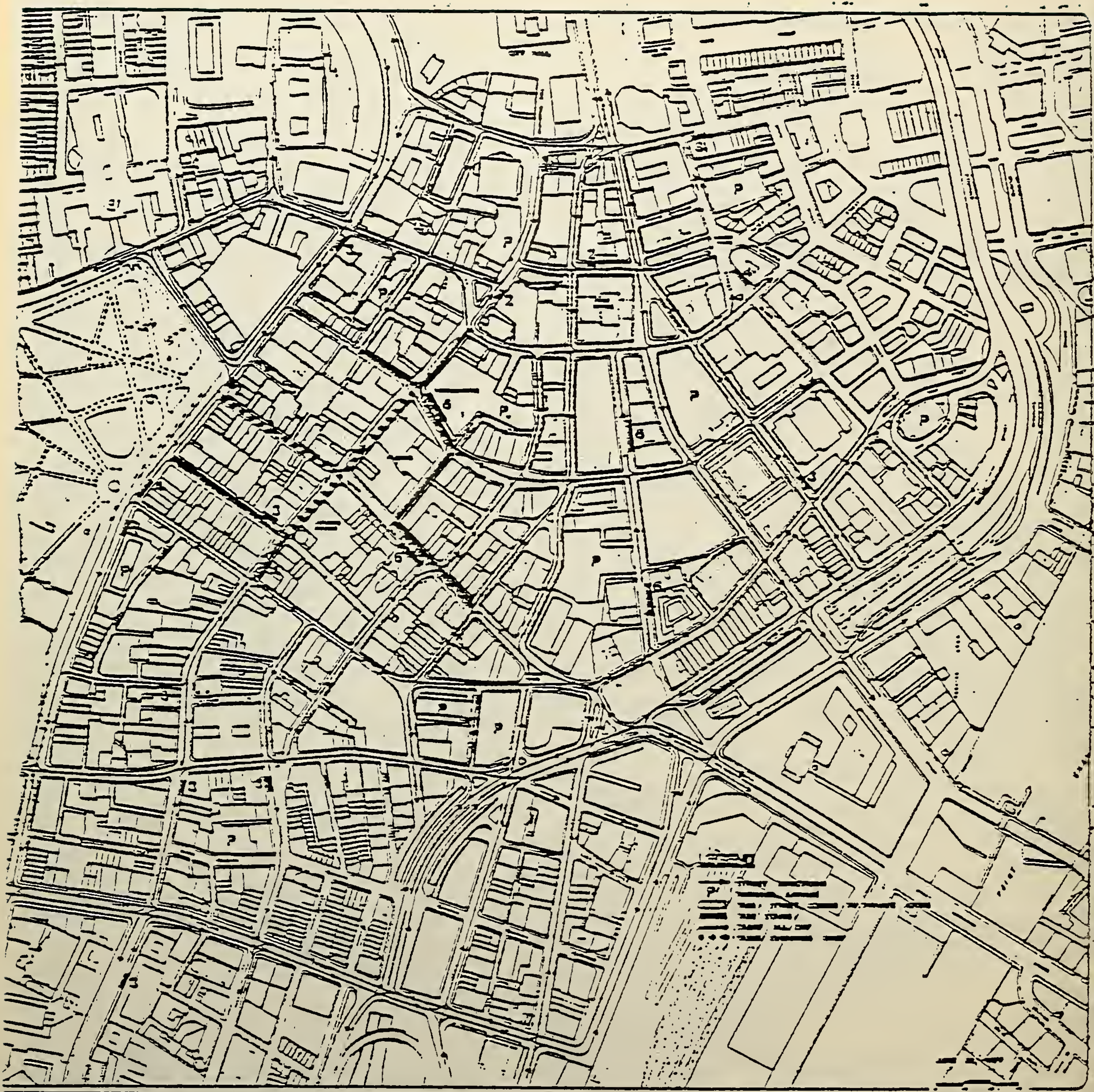
Pedestrian System

3



TRANSIT AND TRAFFIC IMPROVEMENT PROGRAM

GOODS DELIVERY SYSTEM



TRANSIT AND TRAFFIC
IMPROVEMENT PROGRAM

TAXIS

5

pedestrians, taxis and buses. The proposed TTIP circulation pattern is illustrated in Figure 6. As shown, auto traffic will be eliminated from all of Winter, Hawley, Temple Place, and portions of Summer, Washington, Franklin, and Bromfield Streets. Chauncy and Arch Streets will carry northbound traffic to Milk Street, where it can continue west to northbound Washington Street or east to Post Office Square. School Street traffic heading east is diverted to Water Street, allowing Milt Street to run westbound from Arch to Washington and a short section of School Street next to the Boston Five to be closed.

Franklin Street from Arch to Hawley will be open for garage access and taxis only. Bedford Street will run eastbound and connect through West Street to Tremont, forming the southern edge of the project. Washington Street below Bedford will be open to northbound traffic for local access.

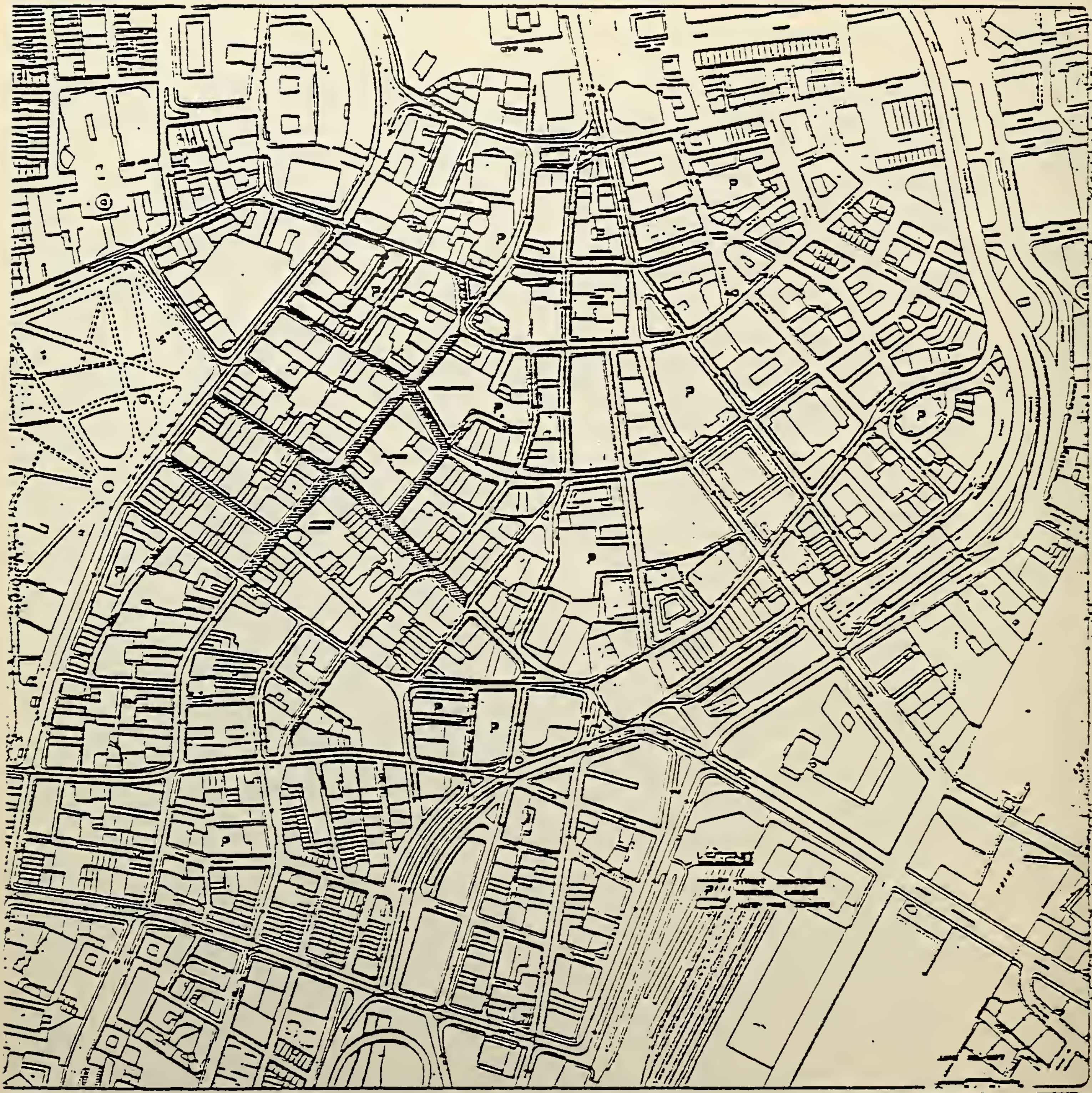
Major traffic circulation will be accommodated on Court, Tremont, School, Federal, Devonshire, Congress, West and Bedford Streets. Under this plan, Chauncy, Arch, West, Bedford, Federal, School, and Water Streets must remain clear of parked cars, strict enforcement of parking regulations is a critical part of the total project.

2. OBJECTIVES OF THE DEMONSTRATION PROJECT

The Boston Transit and Traffic Improvement Program was prepared with the general intent of encouraging the continued physical and economic revitalization of downtown Boston. The program seeks to set up a more balanced circulation framework, make the streets more attractive through specific urban design improvements, and create new programs for the management and utilization of downtown resources. The objectives related to these goals can be stated more specifically as:

Economic Vitality - The project area is above all the commercial center of the Boston metropolitan area. Any traffic rerouting or street improvements must be directed at supporting and expanding markets and opportunities for the downtown economy. The extraordinary street life and activity in the area attest to its role and attraction within the community. The project should work toward the expansion and diversification of this already bustling activity area.

Pedestrians - A continuous pedestrian circulation network within the retail and financial districts will be developed to connect primary activity areas -- concentrations of office, shops, residences and tourist recreational areas -- to one another. Above all, conflicts with vehicular traffic should be minimized.



TRANSIT AND TRAFFIC
IMPROVEMENT PROGRAM

AUTO CIRCULATION

6

Public Transit - Accessibility to and within the project area should be improved by new routing, coordinated stops and schedules, and allocating exclusive street space for transit use where possible. The objective is to bring more people downtown by transit through more efficient and convenient service.

Deliveries, Emergency and Service Vehicles - All necessary access for these vehicles should be maintained; deliveries should be scheduled at times when conflicts with pedestrians and other traffic can be minimized. Delivery time and costs should be minimized through enforced loading zones, exclusive use of streets by delivery vehicles at certain times and provision of off street loading on all new development.

Private Auto Traffic and Parking - On streets in the retail district where private auto traffic seriously interferes with the other circulation elements, it should be restricted or eliminated. A simplified auto circulation system that clearly identifies primary auto circulator streets and secondary auto access streets should be developed. Congestion impacts should be minimized through improvement of intersections, proper traffic enforcement, a new signing system and elimination of parking search and superfluous circulating traffic.

Image and Environment - Finally, the general image and attraction of the older downtown streets should be improved with the goal of creating a physically comfortable street environment free of noise and pollution and equipped with pedestrian amenities. Most important, it is hoped that the project will lead to a physical and institutional framework for improved urban design within the district.

Parking Demand and Traffic Generation Calculations

The procedure used in determining the peak-period parking space requirement for the Lafayette Place development is based upon person-trip generation figures. Total person-trips calculated were translated into auto-driver trips by applying appropriate modal-split and car-occupancy figures. Parking accumulation factors derived from other studies were used for estimating peak parking demands.

The retail development is expected to contain a total of 300,000 square feet of gross leasable area (GLA) for the Lafayette Place development and another 750,000 square feet of existing retail area for Jordan Marsh. The Lafayette Place project also will include a hotel of 500 units.

The following factors have been used in estimating peak-period parking requirements for the retail area as well as the hotel complex:

Retail

-- 35 person-trips/1,000 square feet of GLA.

-- An automobile modal-split of 0.25 for the patrons at Jordan Marsh.[1]

-- An automobile modal-split of 0.30 for the patrons at Lafayette Place.[1]

-- Weekday afternoon peak parking accumulation = 13.5 percent of daily inbound vehicles (2:00 P.M. to 3:00 P.M.)

-- Retail patron auto occupancy of 1.5 persons/auto.

-- 70 percent of patrons in shopping center before 6:00 P.M. on weekdays.

-- For employees: Five person-trips/1,000 square feet of GLA, an auto modal split of 0.10, and an average auto occupancy of 1.3 persons/auto.

Hotel

-- A peak parking demand of 1.15 spaces/unit (includes hotel guests, employees, and visitors).

-- An auto modal split of 0.4.

---

[1] Estimation of modal-split was based upon the survey conducted at the existing Jordan Marsh Store in the Boston CBD area and a similar high class retail area close to the CBD, in April, 1974 by Barton-Aschman Associates.

1. Peak Hour Parking Demand

Based on the above factors, calculation of peak-hour parking demand was conducted as follows (numbers rounded).

Retail (Patrons)

Daily auto trips to Jordan Marsh = 35 x 0.25 x 750 = 6,560
Daily auto trips to Lafayette Place = 35 x 0.30 x 300 = 3,150

Total: 9,710

Total number of autos per day = 9,710/1.7 = 5,710

Maximum Parking Demand = 13.5 percent of 5,710
= 770 spaces (A)

Retail (Employees)

Total number of autos driven by employees

$$\frac{5 \times 0.1 \times 1{,}050}{1.3} = 405$$

Assuming a peak accumulation factor of 0.70,
peak demand = 0.7 x 405 = 285 spaces (B)

Hence: Total demand use to patrons and employees

= (A) + (B)
= 770 + 285
= 1,055 spaces (C)

Hotel

Peak demand = 1.15 x 0.40 x 500 = 230 (D)

Total

Total number of spaces needed for Lafayette Place complex/Jordan Marsh:

= (C) + (D)
= 1,055 + 230
= 1,285 spaces

2. Peak-Hour Traffic Generation

Table 1 indicates the different rates and factors used for calculation of peak-hour traffic generated during different times of the day.[1]

---

[1] Estimation of vehicle trip generation rates based on Lafayette Place traffic analyses by Barton-Aschman Associates, Inc., Transportation Planners (1978) and on data from Trip Generation, Institute of Transportation Engineers Informational Report, 1976.

Preliminary calculations showed that the outbound P.M. peak (5:00 P.M. to 6:00 P.M.) would be the critical period, since, at this time of the day, the existing city streets experience their peak traffic.

Calculation of P.M. Peak Outbound Traffic

Retail

Number of trips generated by Jordan Marsh store = 1.7 x 0.25 x 750 = 320

Number of trips generated by Lafayette Place stores = 1.7 x 0.30 x 300 = 155

Total number of retail trips generated = 475

Hotel

Total trips generated = 0.27 x 0.40 x 500 = 55

Total = 475 + 55 = 530

Assuming that 75% of the 530 vehicle trips generated by the retail complex and the hotel will be related to the proposed garage, the total number of outbound vehicles from the garage between 5:00 P.M. to 6:00 P.M. is equal to 360 + 40 = 400.

Calculation of P.M. Peak Inbound Traffic

Retail

Number of trips generated by Jordan Marsh store = 1.2 x 0.25 x 750 = 225
Number of trips generated by Lafayette Place stores = 1.2 x 0.30 x 300 = 110
Total number of retail trips generated = 335

Hotel

Total trips generated = 0.14 x 0.40 x 500 = 30

Total = 335 = 30 =365

Assuming that 80% of the 365 inbound vehicle trips will be related to the proposed garage, the total number of vehicles to the garage between 5:00 P.M. to 6:00 P.M. is equal to approximately 300 vehicles.

The total number of outbound and inbound trips generated by the Lafayette Place project during the P.M. peak traffic hour (5:00 to 6:00), therefore, is 530 + 365 = 895. The figure represents approximately 28 percent of the total peak hour traffic on the approach and exit routes to the garage in the immediate vicinity of the project area.

Generation of project-related inbound and outbound traffic during each of three other peak traffic periods (outbound shopping peak, inbound A.M. peak, and inbound shopping peak) is calculated in a similar manner, and the results are presented on Table II.A.9 of the text.

Table 1

RATES USED FOR CALCULATING PEAK-HOUR TRAFFIC

Type of Land-Use	Vehicle Trip Generation Rate		Modal-Split	Time of Day
	Inbound	Outbound		
A. Retail				
a. Jordan Marsh	1.20 trips/1,000 sq.ft.	1.70 trips/1,000 sq.ft.	0.25	Outbound P.M. Peak
b. Lafayette Place	1.20 trips/1,000 sq.ft.	1.70 trips/1,000 sq.ft.	0.30	(5:00 P.M. to 6:00 P.M.)
Hotel	0.14 trips/unit	0.27 trips/unit	.40	
B. Retail				
a. Jordan Marsh	0.30 trips/1,000 sq.ft.	2.30 trips/1,000 sq.ft.	0.25	Outbound Shopping Peak
b. Lafayette Place	0.30 trips/1,000 sq.ft.	2.30 trips/1,000 sq.ft.	0.30	(9:00 P.M. to 10:00 P.M.)
Hotel	0.07 trips/unit	0.14 trips/unit	.40	
C. Retail				
a. Jordan Marsh	0.30 trips/1,000 sq.ft.	0.15 trips/1,000 sq.ft.	0.25	Inbound A.M. Peak
b. Lafayette Place	0.30 trips/1,000 sq.ft.	0.15 trips/1,000 sq.ft.	0.30	(7:00 A.M. to 8:00 A.M.)
Hotel	0.14 trips/unit	0.07 trips/unit	.40	
D. Retail				
a. Jordan Marsh	2.10 trips/1,000 sq.ft.	1.20 trips/1,000 sq.ft.	0.25	Shopping Inbound Peak
b. Lafayette Place	2.10 trips/1,000 sq.ft.	1.20 trips/1,000 sq.ft.	0.30	(7:00 P.M. to 8:00 P.M.)
Hotel	0.54 trips/unit	0.54 trips/unit	0.40	

Appendix G

Lafayette Place

Estimation of Daily Water and Sewage Demand

A. Water Demand

1. Hotel

500 units @ average occupancy of 70% (350 units) @ 1.5 guests/unit = 525 persons

525 persons @ 165 gal/capita/day = 86,625 gal./day

2. Employees

1,141 employees @ 40 gal/capita/day = 45,640 gal./day

3. Transients (visitors and shoppers)

Assume 10,500 persons

10,500 persons @ 25 gal/capita/day = 262,500 gal./day

Total = 394,765 gal.day

B. Sewage Demand

Assume sewage demand equal to water demand of 394,765 gal/day, (assuming negligible infiltration with improvements to sewage system).

Appendix H

Lafayette Place

Estimation of Construction Debris

A. Demolition (Jordan Marsh Annex)

Assume demolition debris equals 30% of building volume.

196,900 cu. yds. (building volume) x 30% = 59,070 cu. yds. debris
59,070 cu. yds. @ 2.1 tons/cu.yd. = 124,047 tons debris

Source: BRA Engineering Department

B. Excavation

3-level underground garage @ 147,000 sq. ft. (1st level = 75,000 sq. ft. due to slope of topography) @ 10 ft./level = 136,670 cu. yds. excavation material

136,670 cu. yds. @ 130 lbs./cu./ft. = 239,850 tons

Source: BRA Engineering Department

C. Construction Debris

Assume 70 cu. yds. construction debris per 20,000 sq. ft. building area.

70 x 1,000,000/20,000 = 3,500 cu. yds. debris

3,500 cu. yds. @ 0.35 tons/cu. yd. = 1,225 tons

Source: Chatterjee, S., Urban, L.V., and Mickucki, W., "Planning Suffers from Lack of Building and Demolition Debris Data," Solid Wastes Management, February 1975, p. 12.

Appendix I

SCOPE AND ADMINISTRATION Article 22 in the State Building Code provides for energy conservation standards for all new building construction and substantial renovation projects. Compliance with these energy conservation provisions is accomplished by following the components standards on building enclosure, mechanical systems, service water heating, electrical power distribution and lighting systems, or by using a systems analysis procedure that results in an equivalent saving of energy, or by using non-depletable energy sources such as solar or wind energy.

This overview of Article 22, Energy Conservation, of the Massachusetts State Building Code explains in general terms the requirements of the article.

All questions or design decisions should be based upon information found in the code and not in this outline.

Massachusetts Building Code Commission

ENERGY CODE

DESIGN CONDITIONS The criteria of this section establish the minimum requirements for the thermal design of buildings and for HVAC systems and their parts. Outdoor design temperatures are presented for certain cities throughout the state where complete weather records were available. Indoor design temperatures for all buildings shall be 72°F for heating and 78°F for cooling. There are further specifications for humidity control and ventilation.

COMPONENT DESIGN The major building elements affecting energy consumption are treated individually as building components. In order for a proposed building to comply with the energy code, it must meet or exceed the thermal performance of the aggregate of all the building components.

BUILDING ENCLOSURE ELEMENTS Minimum standards for the conservation of energy in the exterior envelope are obtained by regulating thermal performance and air leakage.

The thermal transmittance, U, of any part of the building envelope is calculated by adding the building material resistances, R, of each element in a cross section and computing the reciprocal of the total resistance. $U = 1/R$

The code provides U values for walls, roofs, floors, and foundations for buildings classified as one and two-family dwellings, multi-family units, and hotels and motels. For all other types of buildings, the thermal performance of the envelope is specified by overall (average) thermal transmittance values for entire walls, roofs and floors, U_o.

For non-residential buildings that are mechanically cooled, the overall thermal transfer through the walls is limited to 34.2 Btu/h/sq. ft.

SERVICE WATER HEATING Hot water for domestic, sanitary, and swimming pool purposes shall be generated and delivered in a manner conducive to saving energy. Criteria have been introduced that govern the performance efficiency of storage water heaters, set insulation standards for unfired hot water storage tanks, and set new requirements for temperature controls. The requirements stated in the code establish new guidelines for flow control and maximum temperature of domestic showers and public restrooms.

Some of the provisions of this section are:

** Standby losses for electric and fossil fuel fired automatic storage water heaters shall be limited. For gas and oil automatic storage heaters, the recovery efficiency shall not be less than 75%.

** The maximum temperature setting for heated swimming pools, except those used for therapeutic purposes, is 80°F. Heated swimming pools, that are unenclosed shall be shut down when outdoor temperature goes below 60°F.

** All showers shall have control devices limiting flow to 3 gal./minute.

** Hot water flow in public lavoratories shall be no greater than 0.5 gal./minute at a temperature no greater than 110°F. Self-closing valves shall limit the amount of water delivered to 0.25 gal. for each period of use.

ELECTRICAL POWER DISTRIBUTION Electrical service systems shall be designed for efficient distribution of electrical energy. Requirements are presented for accessible lighting switching to be included for all areas.

HVAC SYSTEMS This section of the code is concerned with the building elements constituting the environmental control components and systems. Procedures are specified for the determination of heating and cooling loads, equipment and component performance, and control requirements for heating, ventilation, and air conditioning. Criteria are established for insulating HVAC systems and for duct construction.

Special applications such as hospitals, laboratories, and rooms with computers or other thermally sensitive equipment may be exempted from the requirements of this section.

Some of the major provisions of this section are:

** HVAC equipment must meet certain specifications in terms of coefficient of performance or energy efficiency ratios.

** The rated capacity of the heating and/or cooling system at design conditions shall not be greater than 125% of the design load.

** Simultaneous heating and cooling is restricted with respect to use of new energy and the requirement for automatic reset of temperature controls.

** Temperature and humidity controls: At least one thermostat is required for each HVAC system. Temperature set back shall be provided during unoccupied periods. When humidity is controlled, a humidistat is to be provided which will prevent use of new energy to produce a relative humidity above 30 percent when moisture is added or below 60 percent when moisture is removed.

** Economizer Cycle: Each fan system shall be designed to use up to 100% outdoor air for cooling. Exceptions are for systems of less than 5,000 cfm or for certain other conditions in which no energy saving would result.

** Pipe and Duct Insulation: Pipes and ducts must be insulated when an energy saving would result. Pipes and ducts in basements of one and two family dwellings are exempted.

DESIGN BY SYSTEMS ANALYSIS This section of the code establishes design criteria in terms of total energy use by a building including all of its parts. It allows freedom in the design of a building program while producing energy savings. Compliance is optional and requires an analysis of annual energy consumption.

Essentially, a building designed in accordance with the systems analysis procedure complies with the energy conservation standards if its energy consumption is no greater than that of an equivalent building designed in accordance with the sections of the code governing building enclosure, mechanical systems, service water heating, electrical power distribution, and lighting systems.

USE OF NON-DEPLETABLE ENERGY SOURCES If solar, geothermal, wind, or other non-depletable energy is the source of over 50% of the thermal energy needs or over 30% of the total energy needs, the building is exempt from the necessity of the system analysis approach. For buildings receiving less than these proportions from non-depletable energy sources, credits are given in the systems analysis section for the use of non-depletable energy.

MAXIMUM U-VALUES OF WALLS, ROOF/CEILINGS, AND FLOORS FOR RESIDENTIAL BUILDINGS.

ELEMENT	DESCRIPTION	U VALUE
WALLS, EXCEPT: (foundation walls)	ALL CONSTRUCTION	0.08
FOUNDATION WALLS	ALL CONSTRUCTION	0.17
ROOF/CEILING	ALL CONSTRUCTION	0.05
DOORS AND WINDOWS	ALL CONSTRUCTION	0.65
FLOORS	FLOOR SECTIONS (over areas exposed to outside air)	0.08
	UNHEATED SLAB ON GRADE	5.50 (note 1)
	HEATED SLAB ON GRADE	7.75 (note 1)

note 1: R-Value for Perimeter Insulation

MAXIMUM OVERALL U_0-VALUES OF WALLS, ROOF, AND FLOORS FOR NON-RESIDENTIAL BUILDINGS.

ELEMENT	DESCRIPTION	OVERALL U_o VALUE
WALLS	3 STORIES AND UNDER	0.25
	OVER 3 STORIES	0.30
ROOF	ALL CONSTRUCTION	0.07
FLOORS	OVER UNHEATED SPACES	0.08
	UNHEATED SLAB ON GRADE	5.50 (note 2)
	HEATED SLAB ON GRADE	7.75 (note 2)

note 2: R-Value for Perimeter Insulation

R-VALUES OF TYPICAL BUILDING INSULATIONS AT 75°F.

INSULATION	R-VALUE/INCH THICKNESS
STILL AIR	5.6
FIBERGLASS (low density batt)	3.3 to 3.0
FIBERGLASS (high density batt)	4.0
MINERAL WOOL (low density batt)	3.7
POLYSTYRENE (foam bead board, 1 pcf)	4.0
POLYSTYRENE (foam board 2 pcf)	5.1
POLYURETHANE (foam board, 2 pcf, fresh)	7.6
POLYURETHANE (foam board, 2 pcf, aged)	5.8
POLYURETHANE (foamed in place 1.6 to 2 pcf)	6.7
UREA FORMALDEHYDE (foam, 0.6 to 0.8 pcf)	4.2
CELLULOSE (loose fill, 2 to 2.5 pcf)	3.7
MINERAL AND GLASS (loose fill)	3.0 to 2.5

This energy code overview was developed and written by SECA (Service for Energy Conservation in Architecture) under contract from the Massachusetts State Building Code Commission. SECA, located at the Boston Architectural Center is a non-profit organization dedicated to the encouragement of effective energy conservation practice in architecture.

Lafayette Place Air Quality Monitoring Study

Meteorological and Monitoring Equipment Specifications

METEOROLOGICAL EQUIPMENT

The meteorological equipment used during the monitoring program was positioned in the west lot, about midway between the two monitoring locations. Figure 1 shows the location of meteorological equipment with respect to the air monitoring sites.

Wind speed and direction were measured and recorded using a Climatronics Mark III wind measuring system. The wind speed is measured using a 3-cup anemometer, which by means of electronic circuitry converts the mechanical rotation to a voltage proportional to the wind speed. Wind direction is measured by a wind vane, coupled to a precision low-torque potentiometer which when oriented to the north gives a voltage proportional to the wind direction. Figure 2 shows the set-up configuration of the meteorological equipment. The wind speed and wind direction were recorded during all CO monitoring periods on a Rustrak chart recorder, at a speed of one inch per hour. Specifications for the Mark III system are shown in Attachment 1.

CARBON MONOXIDE MONITORING EQUIPMENT

Carbon monoxide concentrations were measured using an Energetics Science Series 2000 carbon monoxide analyzer. The analyzer works on an electro-chemical principal where the carbon monoxide is electro-oxidized to carbon dioxide at a catalytically active electrode. The current measured in the sensor due to the electro-oxidation of carbon monoxide is proportional to the partial pressure of carbon monoxide in the gas sample. The current measured is then converted to an output signal proportional to the measured CO concentration. The measured CO concentrations were then recorded on an Esterline Angus strip chart recorder. The recorder was set at a speed of one inch per hour. The ecolyzer-recorder system is battery powered and is of the type of equipment that is suitable for short term spot monitoring that was undertaken for this program. Specifications for the Ecolyzer are shown in Attachment 2.

The carbon monoxide and wind speed strip chart data was manually digitized and averaged. The strip chart data is digitized as follows. Each time period (in this case one hour) is broken down into four periods. Within each period two to five data points are selected, depending on the slope of the curve. The eight to twenty points from the four groups are then averaged to yield an average value for the time period in question. The wind direction strip chart is visually averaged because it cannot be averaged using the same method as described above.

Source: Parsons Brinckerhoff Quade and Douglass, Inc., "Lafayette Place Air Quality Monitoring Study", April, 1978.

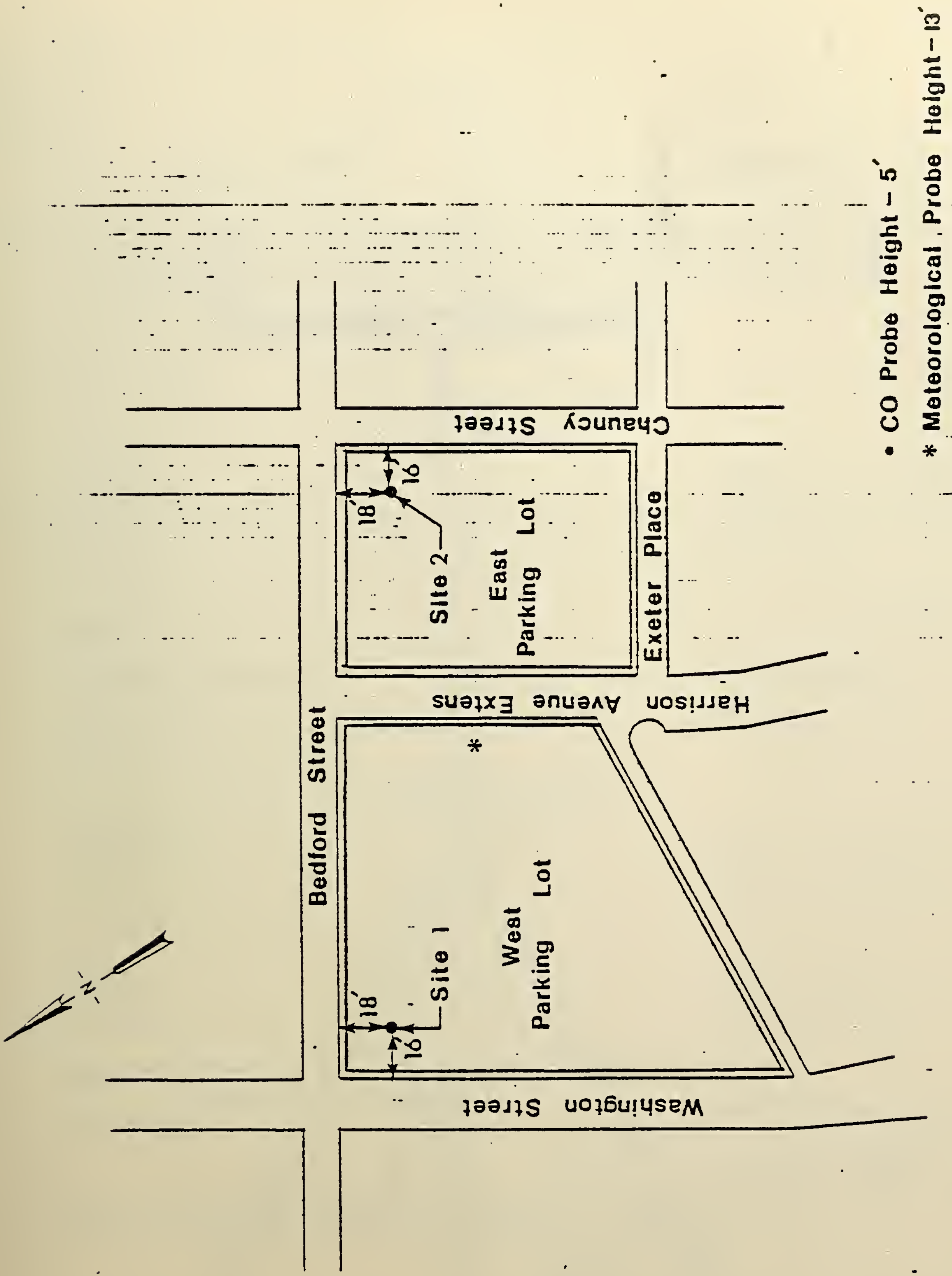


FIGURE 1. Location of CO Probes and Meteorological Equipment

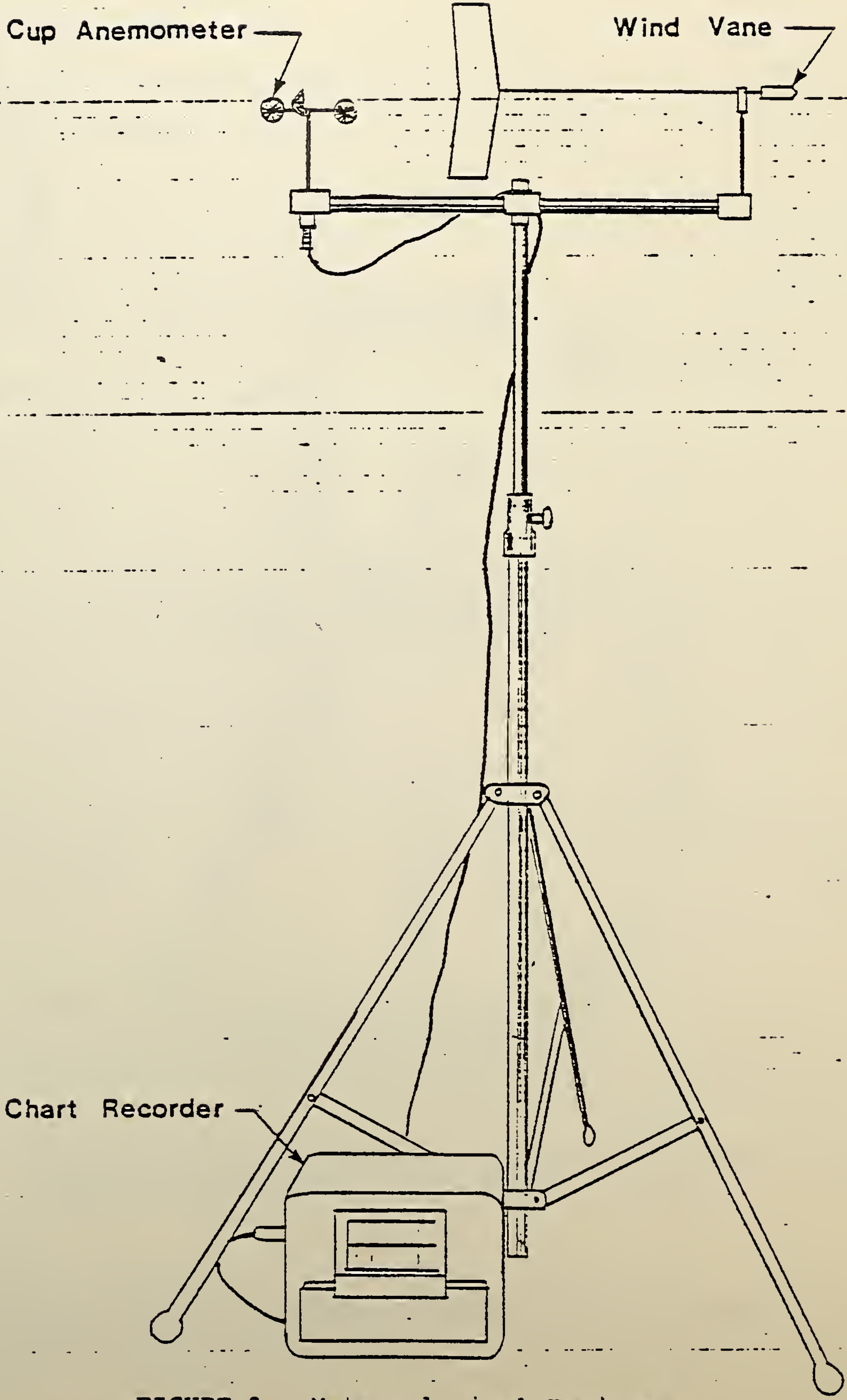


FIGURE 2. Meteorological Equipment

Attachment 1

PERFORMANCE SPECIFICATIONS FOR THE CLIMATRONICS WIND [illegible] MARK III WIND MEASURING SYSTEM

Wind Speed

Accuracy	Sensor: ± .25 MPH or 1.5%
	System: ± .25 MPH or 2%
Range	0-50 MPH
Distance Constant*	8 Feet Maximum
Threshold	0.75 MPH Maximum

Wind Direction

Accuracy	Sensor: ± 1.5%
	System: ± 2%
Range	0-360 degrees
Distance	8 Feet Maximum
Damping Ratio	0.4-0.6
Threshold	0.75 MPH Maximum

*The Distance Constant is defined as feet of air required to pass through transmitter to give 63% of a sharp change.

SPECIFICATIONS -- ENERGETIC SCIENCE SERIES 2000 CO ANALYZER

Attachment 2

Dimensions	13" x 7 3/8" x 7 3/8 "
Weight	9 lbs.
Sensor	Electrochemical
Rise Time	25 sec.
Analytical Reproducibility	±1% of Full Scale
Zero Drift	0.5% of Full Scale in 24 hrs.
Span Drift	1% of Full Scale in 24 hrs.
Noise	±0.2% of Full Scale
Linearity	±1% of Full Scale
Minimum Detectable Sensitivity	0.5% of Full Scale
Sampling Rate	700 cc/min. (1.5 SCFH) with adjustable flow control and flowmeter.
Ambient Temperature Range	0° to 40°C (32° to 104°F)
Temperature Compensation	Built in thermistor compensation.
Relative Humidity Range	5% to 95% RH
Readout	Panel Meter 0-100/0-600 ppm CO Dual Scale, mirrored* Recorder output 0-1V (Recorder Optiona
Electronics	All solid state on printed circuit boa
Calibration	Once a day with known standard of CO.
Sensor Life	> 4500 use hours.
Power	Electronics: Six (6) NiCad "C" cells. Pump: One (1) NiCad "D" cell. Batteries automatically recharged from 120 VAC, 60 Hz power source.
Interference Equivalent	< 1.0 ppm on the following:

N_2O	100 ppm	SO_2	100 ppm
NO	50 ppm	H_2S	50 ppm
NO_2	25 ppm	H_2	108 ppm
C_2H_2	0.3 ppm	NH_3	500 ppm
C_2H_4	1 ppm	C_3H_8	107 ppm
CH_4	50,000 ppm	C_2H_6	100 ppm
CO_2	10,000 ppm		

*Other special ranges are also available as well as multi-range instruments

Appendix K

Bolt Beranek and Newman Inc.

Report No. 3842

Air Quality Impact Analysis of the Proposed Lafayette Place Parking Garage

K.M. Chng, M.J. Thorpe, H.S. Pei, and P.A. Gardner

June 1978

Prepared for:
The Boston Redevelopment Authority

Report No. 3842

AIR QUALITY IMPACT ANALYSIS OF THE PROPOSED LAFAYETTE PLACE PARKING GARAGE

K.M. Chng
M.J. Thorpe
H.S. Pei
P.A. Gardner

June 1978

Prepared by:

Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, MA 02138

Prepared for:

The Boston Redevelopment Authority
One City Hall
Boston, MA 02108

ACKNOWLEDGEMENTS

The authors wish to acknowledge the valuable assistance and suggestions of Messrs. Richard Mertens, Alf Howard, and Edward Colby of the Boston Redevelopment Authority, Messrs. John Lee and Donald White of the U.S. EPA Region 1, and Mr. William Simmons of the Massachusetts Department of Environmental Quality Engineering.

SUMMARY AND CONCLUSION

Existing ambient carbon monoxide data were reviewed and a modeling analysis was conducted to assess the potential impact on ambient air quality of the proposed Lafayette Place Parking Garage in downtown Boston.

On the basis of a review of the site-specific carbon monoxide (CO) data and consultation with the Massachusetts Department of Environmental Quality Engineering (DEQE), the conclusion is that the existing 1-hr CO levels will be below the corresponding State and Federal standards*, but the 8-hr CO levels will most likely exceed the 8-hr State and Federal standards.

The modeling analysis for the impact assessment consisted of:

- An estimate of CO levels at the exits and entrances to the Garage and at selected intersections in the proximity of the Garage
- An estimate of the emissions within the Garage and an assessment of impact on ambient CO levels from the Garage venting system.

The traffic data were provided by the Boston Redevelopment Authority (BRA) and reflected implementation of the proposed Transit and Traffic Improvement Program.

The procedures for estimating the maximum 1-hr and 8-hr ambient CO levels followed the latest Environmental Protection Agency (EPA) guidelines. For all the intersections analyzed, no exceedance of the 1-hr standard of 35 parts per million (ppm) was found. Automobiles, however, idling in a queue and decelerating/accelerating at the approach to an intersection, emit relatively high CO levels. These high short-term levels can result in high 1-hr CO concentrations greater than 20 ppm. In addition, constrained dispersion of the pollutants, as a result of the presence of high building structures on each side of the street, can contribute to a pollution buildup.

---

*See Appendix B.

The 8-hr results were obtained by direct scaling of the 1-hr predictions. Unlike the 1-hr levels, the estimated 8-hr CO levels showed exceedance of the 9-ppm standard at about one-third of a total of 33 receptor locations examined. The highest 8-hr estimate for the west approach to the Kneeland Street and Harrison Avenue intersection showed CO levels about 80% above the standards. The Garage-related traffic's contribution to the 8-hr CO levels is estimated to range from 3% to 47%.

Emissions from within the Garage were based on a peak hour demand and vehicle running times estimated according to the EPA guidelines. The estimated CO emission rate for this peak hour is 10.9 grams per second (g/sec). A number of ventilation requirements were explored to reflect the mix of desirable concentrations within the Garage and in the make-up air. For the minimum requirement (corresponding to a 100-ppm level in the Garage and 5 ppm in the make-up air), a ventilation rate of 209,200 cubic feet per minute (cfm) and a CO discharge rate of 11.3 g/sec were estimated. For the maximum requirement (corresponding to a 35-ppm level in the Garage and a 5 ppm in the make-up air), a ventilation rate of 662,400 cfm and a CO discharge rate of 12.5 g/sec were obtained.

The potential impact of the emissions from the Garage vents on ambient CO levels at the pedestrian level is manifested in an incremental increase in the "background" CO levels. To estimate this impact, an EPA procedure, which reflects the increased turbulence resulting from the effect of buildings, was followed. The analysis consisted of estimating incremental increases in CO levels at three different locations representing increased distances from the Garage.

Both the single-vent system (located on the roof of the facility, adjacent to New Street) and the 3-vent system (located on the roof of the facility, adjacent to New, Chauncy, and Washington Streets) were investigated. The results showed that under maximum ventilation conditions with 1 vent, when emission from the Garage is at its highest rate, an increase of 3.2 ppm could be expected for the 1-hr CO level on the adjacent street. This contribution can be reduced to 2.1 ppm if a 3-vent system is used. For receptors that are farther away, for example, at the intersection of Kneeland Street and Harrison Avenue, this contribution to the 1-hr CO level drops to 1.1 ppm. At this distance, the difference between a 1-vent and a 3-vent system is barely noticeable. The maximum contribution to the 8-hr CO level on the adjacent street from a 1-vent system is estimated at 1.9 ppm. This contribution can be lowered to 1.3 ppm by going to a 3-vent system.

The estimates of the ambient CO levels at the intersections are believed to be rather high. Limited validation of this EPA procedure gave "relative differences (between the observed and the model-estimated CO levels) within a factor of 2." Unfortunately, the "canyon" model aspect of this procedure has not been validated. The tendency to overestimate is especially true when the assumed wind speed drops to 1 meter per second. (The modeling approach was based on an assumed wind speed of 1 meter per second.) If the model is calibrated with actual observations, the predictions of the highest 8-hr CO level would most likely drop to around the 8-hr standard.

Two ameliorating factors should also be taken into account in evaluating these predictions. The first factor is the Federal Motor Vehicle Emission Control Program (FMVECP), which will have a dramatic impact on reducing the exhaust emission rates for all motor vehicles. In general, we note a continuing decrease in emission rates with time such that by 1985, the emission rate will be 65% of the 1982 value, and by 1990, this rate will be 40% of the 1982 value. The second ameliorating factor is the proposed Inspection/Maintenance (I/M) Program. The I/M program is part of the Transportation Control Program and appears to have a high probability of being promulgated in metropolitan Boston. When the I/M program is implemented, additional emission reductions of about 2% in 1982 and 13% in 1985 (reflecting the adoption of a set of stringent criteria) will be realized.

TABLE OF CONTENTS

page

ACKNOWLEDGEMENTS iii

SUMMARY AND CONCLUSION iv

SECTION 1. INTRODUCTION 1

1.1 Study Objective 1
1.2 Scope and Approach 1

2. EXISTING CONDITIONS 3

2.1 Air Pollution Meteorology in the Project Area 3
2.2 Existing Ambient Air Quality 3

3. AIR QUALITY IMPACT ASSESSMENT 8

3.1 Carbon Monoxide Levels at Selected Intersections 8

3.2 Emissions Within the Garage and Impact of Garage Venting System 15

REFERENCES 21

APPENDIX A. SOURCES AND EFFECTS OF CARBON MONOXIDE A-1

B. AIR QUALITY STANDARDS FOR CARBON MONOXIDE B-1

C. EFFECTS OF THE FEDERAL MOTOR VEHICLE EMISSION CONTROL PROGRAM AND THE INSPECTION/MAINTENANCE PROGRAM ON ESTIMATES OF CARBON MONOXIDE EMISSIONS C-1

1. INTRODUCTION

1.1 Study Objective

The objective of this study is to assess the proposed Lafayette Place Parking Garage's potential impact on ambient air quality.

1.2 Scope and Approach

The analysis of air quality impact from the Lafayette Place Parking Garage consists of estimating carbon monoxide (CO) levels at the exit/entrances to the Garage and at a number of major intersections in the vicinity of the Garage. Traffic data were provided by the Boston Redevelopment Authority (BRA) [*1*] and are based on the assumption that the proposed Boston Transit and Traffic Improvement Program [*2*] will be implemented. The air quality analysis also addresses the emissions of CO within the Garage and the ventilation requirements needed to keep levels in the Garage within certain required levels. In addition, the impact of vented Garage emissions on ambient CO levels in the immediate vicinity of the Garage is assessed.

The general procedure for this analysis follows the latest Environmental Protection Agency (EPA) guidelines for evaluating indirect sources [*3*], except that the automotive emission factors were estimated using the latest data as contained in EPA's MOBILE I computer program [*4*]. Procedures for estimating ventilation requirements for the Garage are based on Massachusetts building codes [*5*] and the American Society of Heating, Refrigerating, and Airconditioning Engineers (ASHRAE) guidelines [*6*].

Section 2 of this Report summarizes the existing conditions in the project area with respect to the air pollution meteorology and to ambient CO levels. The assessment of air quality impact is given in Sec. 3. The impact assessment is divided into two subsections:

- Relating to estimates of ambient CO levels at selected intersections in the proximity of the Garage
- Relating to emissions within the Garage and the potential impact on ambient CO concentrations resulting from emissions from the Garage venting system.

Supplementary data on sources and effects of CO are contained in Appendix A, air quality standards for CO are contained in Appendix B, and the effects of the Federal Motor Vehicle Emission Control Program and the Inspection/Maintenance Program on emissions of CO are described in Appendix C.

2. EXISTING CONDITIONS

2.1 Air Pollution Meteorology in the Project Area

A survey of meteorological records that may be applicable to the Boston area indicates that the most comprehensive and readily available data were compiled at Logan Airport, 2 miles east-northeast of the project site. Surface wind data at a Logan Airport site, averaged over a recent 5-yr period, are presented as wind roses in Fig. 1. The relative frequency of occurrence is disaggregated by wind direction.

For the winter months, a predominantly westerly wind flow direction exists. During the summer months, sea breezes are quite frequent, and this is reflected in the increase in frequency of easterly winds, as shown in Fig. 1. Low wind speeds and calm conditions are conducive to poor pollutant dispersal. On an annual basis, calm conditions and wind speeds below 3 miles per hour (mph) occur together about 2% of the time.

The wind data compiled at Logan can be interpreted as being generally applicable to wind conditions approaching the downtown Boston area. But as a result of the effects of buildings in Boston's central business district, these wind conditions are modified both in direction and speed because of a channelization effect in street canyons.

2.2 Existing Ambient Air Quality

The Massachusetts Department of Environmental Quality Engineering (DEQE) operates a number of continuous air quality monitoring stations throughout the metropolitan Boston area. These stations are not very representative of the downtown Boston

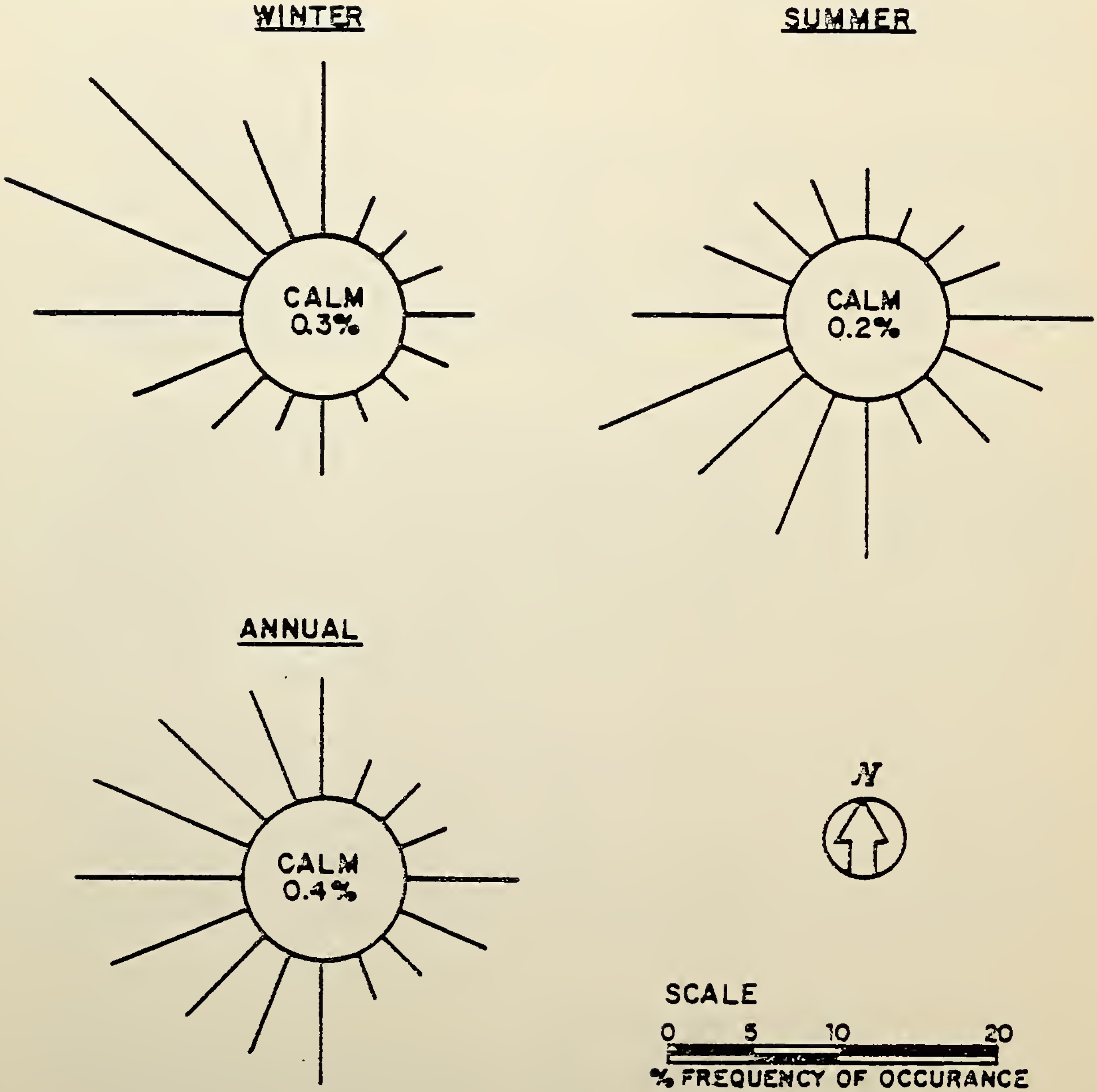


FIG. 1. WIND DISTRIBUTION BY DIRECTION FOR BOSTON (BASED ON LOGAN AIRPORT DATA FROM JANUARY 1966 TO DECEMBER 1970).

area where the proposed Lafayette Place Garage will be located. Nevertheless, there are two sets of recent CO measurements, taken in the project area, that give an indication of the existing CO levels.

The first set of field measurements consisted of a series of 1-hr CO readings taken at two sites in an open parking lot within the site of the proposed garage [*7*]. The CO levels were measured using an electrochemical method. The measurement period lasted only 2 days, and 8-hr averages were not compiled. The second set of data was collected at a site on Washington Street [*8*], approximately 500 ft from the Garage site and covered a 12-day period in April 1978. These CO levels were also measured with an electrochemical method. The sampling probe location did not conform to existing EPA guidelines. The monitoring sites are shown in Fig. 2. These data together with data from a number of other monitoring stations around Boston are summarized in Table 1.

An examination of the measured data indicates that the highest 1-hr CO levels for existing conditions at the proposed Garage site (M-1) and at the Washington Street site (M-3) are 7.2 and 12 parts per million (ppm), respectively. The highest 8-hr average is estimated at about 8 ppm. From the site-specific measurements, data compiled at the other Boston locations, and discussion with DEQE [*9*], the existing 1-hr CO levels will not exceed the 1-hr CO standard of 35 ppm, but the 8-hr average levels could exceed the 8-hr standard of 9 ppm. These observations are substantiated by the recent EPA designation, which, in regard to CO, considers Metropolitan Boston a "non-attainment" area [*10*].

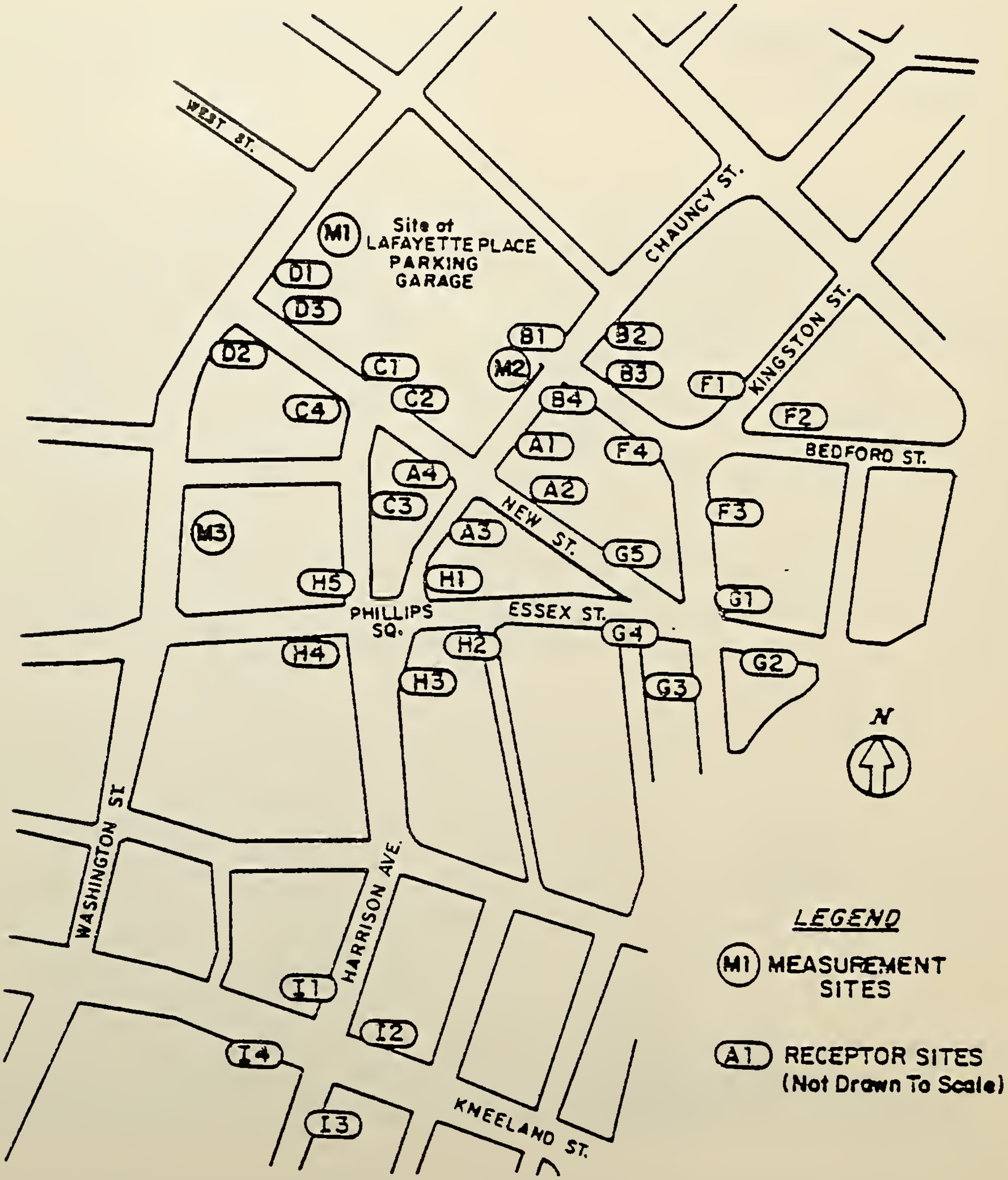


FIG. 2. PROJECT AREA SHOWING MEASUREMENT LOCATIONS AND RECEPTOR SITES.

TABLE 1. CARBON MONOXIDE DATA FOR SELECTED SITES IN THE PROJECT AREA NAD METROPOLITAN BOSTON.

Site Description	Comments	Concentration in Parts Per Million (ppm)			
		Maximum 1-hr.	No. of Times > Standard (35 ppm)	Maximum 8-hr.	No. of Times > Standard (9 ppm)
Garage Sites* at Washington St. and at Chauncy St.	2 days of 1-hr samples using electrochemical analyzer	7.2	0	No data	No data
At Washington St.* about 1 block away from Garage Site	12 days of continuous sampling using electrochemical analyzer; Probe height at 30 ft	12	0	7.9	0
Kenmore Square	State-operated continuous monitor using NDIR analyzer†	23	0	16.6	331**
Callahan Tunnel	State-operated continuous monitor using NDIR analyzer	25	0	15.3	21

*See Fig. 2.

**Includes overlapping 8-hr time periods as processed by the computer. (Correction to exclude overlapping counts has not been made.)

†Nondispersive Infrared analyzer.

3. AIR QUALITY IMPACT ASSESSMENT

3.1 Carbon Monoxide Levels at Selected Intersections

Eight intersections, including the two exit/entrances to the proposed Garage, were selected for analysis, because they were near the proposed Garage site and represented areas where Garage-related traffic would contribute a significant impact on the total traffic volume. Projected traffic volumes and flow in the vicinity of the Garage are shown in Fig. 3. The selected intersections include:

- Chauncy St. Exit/Entrance
- New St. Exit/Entrance
- Chauncy and New Sts.
- New and Washington Sts.
- Bedford and Kingston Sts.
- New, Essex, and Kingston Sts.
- Phillips Square
- Kneeland St. and Harrison Ave.

At each intersection, receptor sites were located on the sidewalk of each roadway leading into the intersection. A total of 33 receptors was selected. The sites represented areas of public access and are shown in Fig. 2.

Estimates of maximum 1-hr CO concentrations at each receptor location were obtained using the Street Canyon Model as described in the EPA guideline document [3]. A set of conservative, but physically realizable, modeling conditions were assumed to maximize the emission rates and resulting concentrations. These include:

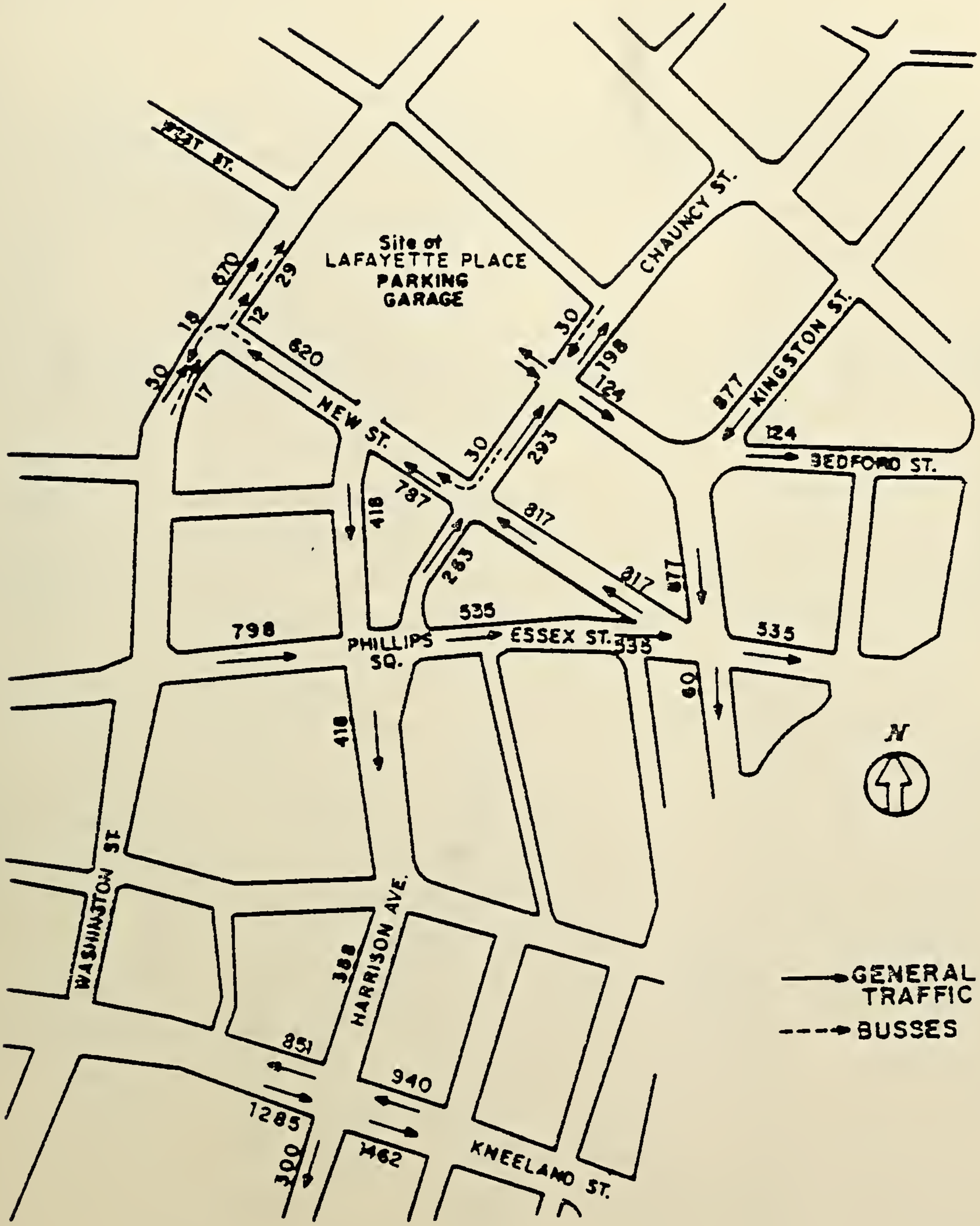


FIG. 3. PROJECTED PEAK HOUR TRAFFIC VOLUMES AND TRAFFIC FLOW IN THE VICINITY OF THE LAFAYETTE PLACE PARKING GARAGE.

- a rooftop wind speed of 1 meter per second
- winter conditions with an ambient temperature of 32°F
- an average speed of 15 mph for the uninterrupted flow of the traffic.

In addition, traffic mix data from the BRA's traffic survey were incorporated into the estimate. For traffic in the Garage, a 94% hot transient and 6% cold start mix was used. This mix was based on data from the existing parking lot on the site, which indicated that 94% of the vehicles surveyed were parked for less than 4 hours [*1*]. For general traffic in the area, the national Cold/Hot Fraction was used [*11*]; this mix consists of 21% cold start, 27% hot transients, and 52% stabilized.

Table 2 shows the maximum 1-hr CO estimate for the projected year of completion (1982). The CO levels around the exit/entrances are between 10 and 15 ppm. The highest 1-hr level is estimated to be 34 ppm for the west approach to the Kneeland Street and Harrison Avenue intersection. In this instance, the projected demand volume has exceeded capacity on this approach. Maximum 1-hr CO level on the approaches to the other intersections generally ranged from 15 to 25 ppm. These high levels were attributable almost entirely to the idling and acceleration/deceleration emissions from the automobiles on the approach to an intersection. In these instances, the free-flow component of the emissions was usually between 10% and 20%. Where free-flow emissions dominate — for example, at receptors A4 and G5 — the CO levels were often less than 10 ppm. All of the 1-hr estimates included an assumed background level of 5 ppm. This background level was arrived at after discussion with EPA Region I [*12*]. The 1-hr standard of 35 ppm was not exceeded at any of the receptors.

TABLE 2. PREDICTED (1982) MAXIMUM 1-HR AND 8-HR CARBON MONOXIDE CONCENTRATIONS AT SELECTED RECEPTOR LOCATIONS.

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr†	8-hr**
Chauncy and New Sts.	A1 - North approach on Chauncy St.	42.0	6.9	3.9
	A2 - East approach on New St.	21.6	24.8	12.6
	A3 - South approach on Chauncy St.	46.8	26.5	13.4
	A4 - New St. west from intersection	22.5	9.8	5.3
Chauncy and Bedford Sts.	B1 - By garage exit/entrance	100.0	10.0	5.5
	B2 - North approach on Chauncy St.	14.1	6.4	3.7
	B3 - On Bedford	100.0	5.6	3.3
	B4 - South approach on Chauncy St.	42.0	12.9	6.8
New St. and Harrison Ave.	C1 - By garage exit/entrance	100.0	12.7	6.8
	C2 - East approach on New St.	22.5	15.5	8.1
	C3 - On Harrison, south of intersection	40.2	6.0	3.5
	C4 - On New St. going west	12.9	8.6	4.8

*See Fig. 2.

†1-hr standard is 35 ppm.

**8-hr standard is 9 ppm.

TABLE 2. *(Cont'd.)*

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr†	Concentrations in ppm 8-hr**
Washington and New Sts.	D1 - On Washington, north of intersection	11.9	8.2	4.5
	D2 - South approach on Washington	0	5.9	3.4
	D3 - East approach on New St.	12.9	25.4	12.9
Bedford and Kingston Sts.	F1 - North approach on Kingston St.	20.2	19.2	10.0
	F2 - On Bedford, going east	100.0	5.4	3.2
	F3 - On Kingston St., going south	20.2	9.2	5.0
	F4 - West approach on Bedford St.	20.2	8.3	4.6
New and Essex Sts.	G1 - North approach on Kingston St.	20.2	24.0	12.1
	G2 - On Essex, going east	0	8.2	4.6
	G3 - On Kingston, going south	0	5.3	3.2
	G4 - West approach on Essex	0	15.2	7.9
	G5 - going west on New St.	21.7	9.5	5.2

*See Fig. 2.

†1-hr standard is 35 ppm.

**8-hr standard is 9 ppm.

Table 2. *(Cont'd.)*

Intersection	Receptor No. and Location*	Percent (%) Garage-Induced Traffic	Concentrations in ppm 1-hr[†]	Concentrations in ppm 8-hr**
At Phillips Square	H1 - Going north on Chauncy St.	46.8	6.5	3.7
	H2 - Going east on Essex St.	0	8.2	4.6
	H3 - Going south on Harrison Ave.	40.2	6.2	3.6
	H4 - West approach on Essex St.	15.4	22.5	11.5
	H5 - North approach on Harrison St.	40.2	27.8	14.2
Harrison Ave. and Kneeland St.	I1 - North approach on Harrison St.	43.3	15.6	8.1
	I2 - East approach on Kneeland St.	4.7	20.8	13.9
	I3 - Going south on Harrison Ave.	0	23.1	11.7
	I4 - West approach on Kneeland St.	2.6	33.7	16.2

*See Fig. 2.

[†] 1-hr standard is 35 ppm.

**8-hr standard is 9 ppm.

Table 2 also shows the maximum 8-hr prediction for the same set of receptor locations. These numbers were obtained from the 1-hr results by direct scaling. The 8-hr level includes a background level of 3 ppm, from direct scaling of the 1-hr background level. Unlike the 1-hr estimates, the 8-hr estimates showed exceedance of the standard of 9 ppm at 10 receptor locations. At the Chauncy and New St. exit/entrances, the 8-hr levels were 5.5 and 6.8 ppm, respectively. The highest 8-hr level, located at the west approach to the Kneeland Street and Harrison Avenue intersection, was 16.2 ppm, which is about 80% over the standard. The highest 8-hr estimate for the remaining 5 intersections ranged from 10 to 14.2 ppm. The Garage's contribution to this potential problem can be estimated on the basis of the percentage of the total traffic volume that is attributable to accessing and egressing from the Garage. The Garage's contribution ranges from 3% (at the west approach to Kneeland and Harrison) to 47% (at the south approach to Chancy and New), as shown in Table 2. The contributions from the CO vented from the Garage should be added to these concentrations. These contributions are estimated in Sec. 3.2.

The estimates of the ambient CO level at the intersections are believed to be high. Limited validation of the EPA procedure gave "relative differences (between the observed and the model estimated CO levels) within a factor of 2." Unfortunately, the "canyon" model aspect of this procedure was not validated. The tendency to overestimate is especially pronounced when the assumed wind speed drops to 1 meter per second or less. Our modeling approach was based on an assumed wind speed of 1 meter per second. If the model were calibrated with actual observation, the prediction of the highest 8-hr CO level in 1982 would drop to around the 8-hr standard of 9 ppm. A couple of ameliorating factors should also be taken into account in evaluating these predictions. The first factor is associated with the Federal Motor Vehicle Emission Control Program (FMVECP), which will have a dramatic impact on reducing the exhaust emission rates for all motor vehicles. The impact of the FMVECP on composite (reflecting the mix of motor vehicle age and mileage as used in this study) exhaust emission factors for CO can be found in Appendix C. In general, we note a continuing decrease in emission rates with time such that by 1985, the emission rate will be 65% of the 1982 value, and by 1990, this rate will be 40% of the 1982 value. The other ameliorating factor is associated with the proposed Inspection/Maintenance (I/M) Program. The I/M program is part of the Transportation Control Program and appears to have a high probability of being promulgated because metropolitan Boston has been designated by EPA as a "non-attainment" area with respect to the 8-hr CO standard. When the I/M program is implemented, additional emission reductions of about 2% in 1982 and 13% in 1985 (based on a conservative estimate, reflecting the adoption of a set of stringent criteria) will be realized.

3.2 Emissions Within the Garage and Impact of the Garage Venting System

Carbon monoxide emissions within the Garage are estimated based on peak hour demand, gate capacities, vehicle running times, and vehicle emission factors. Demand and gate capacity data were provided by the BRA [*1*]. Vehicle running times were estimated using the EPA guidelines [*3*] and the general layout of the Garage, and some assumptions relating to the average vehicle speed inside the Garage (about 7 mph) and the orientation of the parking stall with respect to the travel lane (assumed to be at 90 degrees). Vehicle emission factors for both idling and 7 mph were obtained from the MOBILE I program [*4*]. The estimated CO emission rate during the peak hour is 10.9 grams per second.

To determine the ventilation requirements for the Garage, a number of considerations were taken into account to formulate four ventilation scenarios for further analysis of impact on the ambient environment. These considerations include the following:

- The ASHRAE guidelines for general garage ventilation of 1 cfm/sq ft (cubic foot per minute per square foot of space) and four air changes per hour
- The BOCA [*13*] and Massachusetts State Codes [*5*] specifying 100 ppm for maximum permissible levels
- The OSHA 8-hr standard of 50 ppm for occupational exposure
- Massachusetts' and EPA's 1-hr standard of 35 ppm
- Estimated concentrations of CO in the make-up air.

Four ventilation scenarios were selected, as shown in Table 3. Note that in order to provide for a maximum concentration of 35 ppm within the Garage, using make-up air with 5 ppm CO, it would require a ventilation rate of 662,400 cfm. This rate is more than 25% above the rate provided by the general ASHRAE guidelines. The vented emission rates that will have an impact on the ambient CO levels outside the Garage range from 11.3 g/sec to 12.5 g/sec.

TABLE 3. GARAGE VENTILATION PARAMETERS.

Ventilation Scenario Identification No.	Description of Ventilation Assumptions	Emission Rate Within Garage (g/sec)	Maximum Concentration in the Garage (ppm)	Concentration in the Make-up Air (ppm)	Ventilation Rate (cfm)	Vented Emission Rate (g/sec)
A	Allowance of 100 ppm in the Garage, 5 ppm in the make-up air, and 209,200 cfm ventilation rate	10.9	100	5	209,200	11.3
B	Same as A, except make-up air is 9 ppm and ventilation rate is 218,400 cfm	10.9	100	9	218,400	11.8
C	Allowance of 50 ppm in the garage, 5 ppm make-up air, and a ventilation rate of 441,600 cfm	10.9	50	5	441,600	11.9
D	Allowance of 35 ppm, 5 ppm make-up air, and a ventilation rate of 662,400 cfm	10.9	35	5	662,400	12.5

The impact of the vented CO from the Garage on the modeling predictions of CO levels at the pedestrian level is manifested as an added component to the "background" CO. This incremental increase was estimated using an EPA workbook method [14] for treating pollutant dispersion in turbulent wakes of buildings.

Our analysis consisted of:

1. A single vent located on the roof of the facility on the side adjacent to New Street

2. Three vents located on the roof of the facility on the sides adjacent to New, Chauncy, and Washington Streets.

The vents are estimated to be about 35 ft above street level. The increases in background CO levels are computed at three locations representing increasing distances from the Garage, i.e., at the adjacent street, at Phillips Square, and at the intersection of Kneeland Street and Harrison Avenue. The contributions that are vented from the Garage should be added to the estimated CO levels shown in Table 2 to obtain the total impact from all sources. The results are shown in Table 4.

Maximum 1-hr impact results from ventilation scenario D (with a single vent) on the adjacent street, where an increase of 3.2 ppm over the 5-ppm background is estimated. At the intersection of Kneeland and Harrison, this impact decreases to 1.1 ppm. Variation from one ventilation scenario to the next is small. When three vents are used, the impact on the adjacent streets decreases to 1.9 ppm and to 0.7 ppm at the Kneeland Street and Harrison Avenue intersection. The 8-hr results were obtained by direct scaling and therefore show similar variation from one ventilation scenario to the next.

TABLE 4. EFFECTS OF GARAGE EMISSIONS ON AMBIENT CARBON MONOXIDE LEVELS IN THE PROJECT AREA.

Ventilation Scenario Ident. No.	Selected Impact Areas	Impact on CO Levels* 1-Vent System† 1-hr	8-hr	3-Vent System** 1-hr	8-hr
A	a) nearest street	2.9	1.7	1.9	1.1
	b) Phillips Sq.	1.8	1.1	1.4	0.8
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
B	a) nearest street	3.0	1.8	2.0	1.2
	b) Phillips Sq.	1.9	1.1	1.5	0.9
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
C	a) nearest street	3.1	1.9	2.0	1.2
	b) Phillips Sq.	1.9	1.1	1.5	0.9
	c) Kneeland & Harrison	1.0	0.6	1.0	0.6
D	a) nearest street	3.2	1.9	2.1	1.3
	b) Phillips Sq.	2.0	1.2	1.6	1.0
	c) Kneeland & Harrison	1.1	0.7	1.1	0.7

*CO levels are given in parts per million (ppm).

†When 1 vent is used, the vent is located on the roof of the facility adjacent to New St.

**When 3 vents are used, they are located on the roof of the facility adjacent to New, Chauncy, and Washington Sts.

Using 1 or 3 vents for the Garage emissions has no impact for receptor locations at or further than the intersection of Kneeland Street and Harrison Avenue. The difference in the number of vents makes more of an impact for receptors that are near the Garage. For the adjacent street, contributions of 3.2 ppm for a single vent can be reduced to 2.1 ppm by going to a 3-vent system. The savings estimated for the 8-hr average value – by going from a 1- to a 3-vent system – amount only to 0.6 ppm. At neighboring intersections such as Chauncy and New Streets, where 8-hr levels greater than 13 ppm are estimated, this approximately 1/2-ppm savings does not, in itself, appear to be sufficient grounds to warrant a multivent selection. Other factors that should be considered before making a decision on using either a single- or a 3-vent system include desired ventilation characteristics, space requirements for duct work, and costs of duct work associated with the choice of vent system.

REFERENCES

1. Boston Redevelopment Authority, personal communications, Boston, June 1978.

2. "Transit and Traffic Improvement Program," Grant Application by the Boston Redevelopment Authority, Boston, to the Urban Mass Transportation Administration, March 1978.

3. "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources," Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, August 1977.

4. Lewis E. Guthman, "MOBILE I: Mobile Source Emissions Model," Environmental Protection Agency, Office of Transportation and Land Use Policy, Washington, D.C., May 1978.

5. "The Commonwealth of Massachusetts State Building Code," Office of the Secretary, Boston, January 1975.

6. *ASHRAE Handbook of Fundamentals*, The American Society of Heating, Refrigerating and Airconditioning Engineers, Inc., New York, N.Y., 1972.

7. "Lafayette Place Air Quality Monitoring Study," prepared by Parsons Brinckerhoff Quade & Douglas, Inc., for the Boston Redevelopment Authority, Boston, April 1978.

8. Communications from the Massachusetts Department of Environmental Quality Engineering to the Boston Redevelopment Authority, Boston, June 1978.

9. Massachusetts Department of Environmental Quality Engineering, personal communications, Boston, June 1978.

10. "Air Pollution Status of Urbanized Areas with Populations of More than 200,000 People," *Environmental Reporter,* The Bureau of National Affairs, Inc., Washington, D.C., February 1978.

11. "Mobile Source Emission Factor for Low-Altitude Areas Only," Environmental Protection Agency, Office of Air and Waste Management, EPA-40019-78-006, March 1978.

12. U.S. Environmental Protection Agency Region I, personal communications, Boston, June 1978.

13. *BOCA Basic Building Code/1970*, 5th Ed., Building Officials & Code Administrators International, Inc., Chicago, 1973.

14. D. Bruce Turner, "Workbook of Atmospheric Dispersion Estimates," Environmental Protection Agency, Office of Air Programs, Research Triangle Park, North Carolina, 1970.

APPENDIX A
SOURCES AND EFFECTS OF CARBON MONOXIDE

Carbon Monoxide (CO) is formed from the incomplete combustion of fossil fuels. In the Boston Air Pollution Control District, automotive vehicles are responsible for over 95% of the total CO emissions. Gasoline-fueled vehicles are especially culpable.

CO is relatively inert, and since it is generally emitted near ground level, the concentration of CO tends to maximize close to the source (a roadway, for example), and the pollution problem is usually localized.

The toxicity of CO is caused by its affinity for combination with blood hemoglobin; as a result, it inhibits the ability of the blood to transport oxygen. Low-level exposure of a few hours can result in temporary impairment of the psychomotor functions. At higher exposures, excess strain is put on patients with heart conditions.

APPENDIX B

AIR QUALITY STANDARDS FOR CARBON MONOXIDE

National Ambient Air Quality Standards have been promulgated by the U.S. Environmental Protection Agency on April 13, 1971. Massachusetts standards are identical to the Federal ones. The primary standards are intended to protect the public health, while secondary standards are designed to protect the public welfare from any known or anticipated effects. These ambient standards are as follows:

Averaging Time	FEDERAL		MASSACHUSETTS	
	Primary	Secondary	Primary	Secondary
1-hr maximum	35 ppm*	35 ppm	35 ppm	35 ppm
8-hr maximum	9 ppm	9 ppm	9 ppm	9 ppm

(* ppm is parts per million)

These standards are not to be exceeded more than once per year.

APPENDIX C

EFFECTS OF THE FEDERAL MOTOR VEHICLE EMISSION CONTROL PROGRAM AND THE INSPECTION/MAINTENANCE PROGRAM ON ESTIMATES OF CARBON MONOXIDE EMISSIONS

Composite exhaust emission factors for carbon monoxide for all vehicle categories are expected to decrease with time. This decrease is especially dramatic for gasoline-powered light-duty vehicles, a category that includes most of the private-passenger automobiles. The decrease is affected by mandated exhaust emission standards, which are increasingly more stringent, for later-model vehicles. The effects of the Federal Motor Vehicle Emission Control Program (FMVECP) are shown in Fig. C.1. For vehicles with operating speeds of 15 mph, the composite emission factor drops from about 95 grams per mile (g/mile) in 1978 to 25 g/mile in 1990 – a decrease of about 74%. If the assumed year of project completion is 1982, this emission factor is estimated to be 62 g/mile. The decrease also applies to idling emissions where a 1978 average of about 23 grams per second (g/sec) will drop to 4.6 g/sec in 1990. If traffic volume and operating conditions remain constant, savings in CO emissions from 1982 to 1990 for the 15-mph free-flow emissions and the idling emissions are, respectively, 60% and 65%.

Since Boston has been designated as a "non-attainment" area with respect to carbon monoxide primary standards, it would appear that a motor vehicle Inspection and Maintenance (I/M) program will most likely be promulgated. The effects of an I/M program are illustrated in Fig. C.2. It is not evident at this

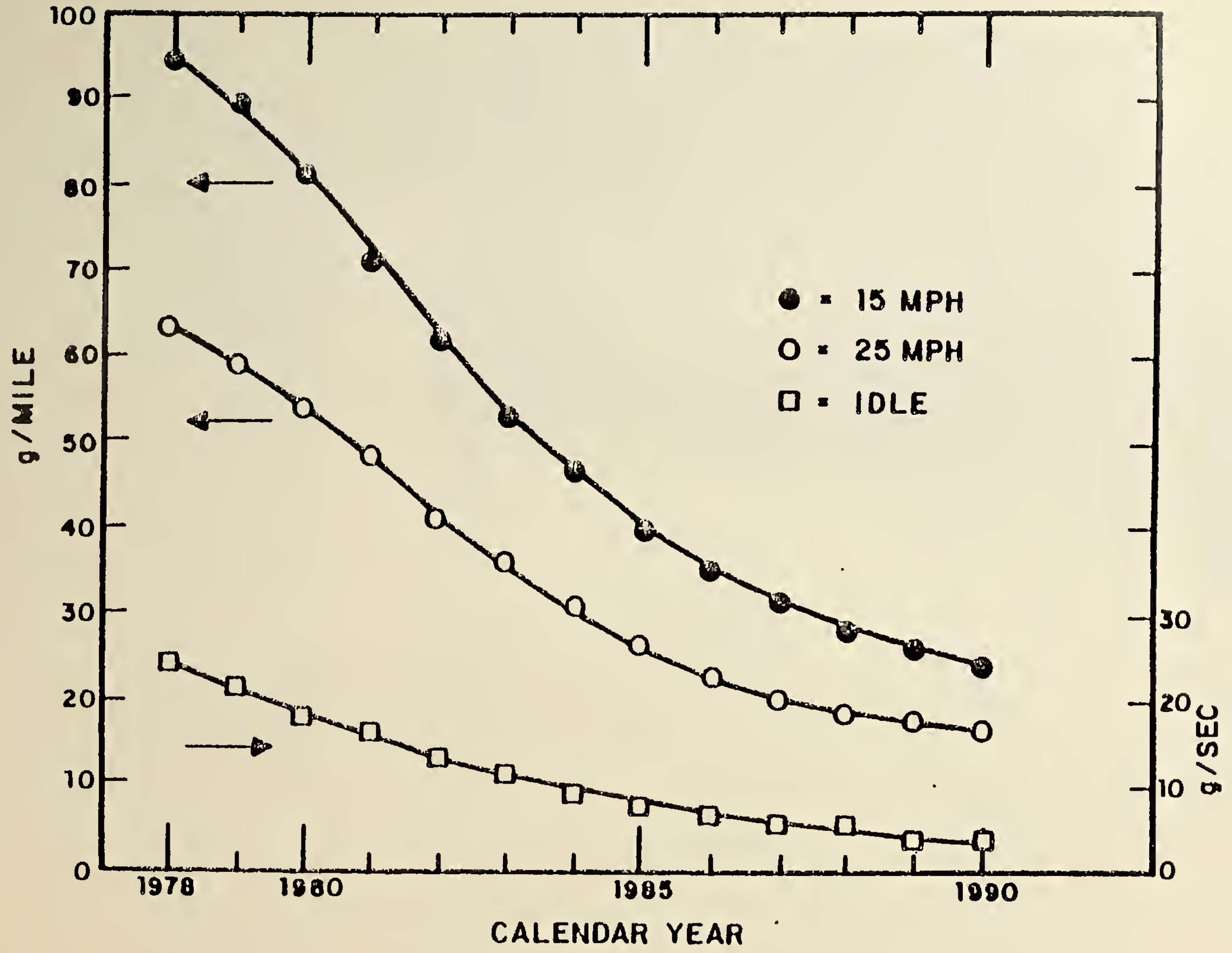


FIG. C.1. EFFECTS OF FEDERAL MOTOR VEHICLE EMISSION CONTROL PROGRAM ON LIGHT-DUTY VEHICLE COMPOSITE EMISSION FACTORS, FOR CALENDAR YEAR 1978 THROUGH 1990.

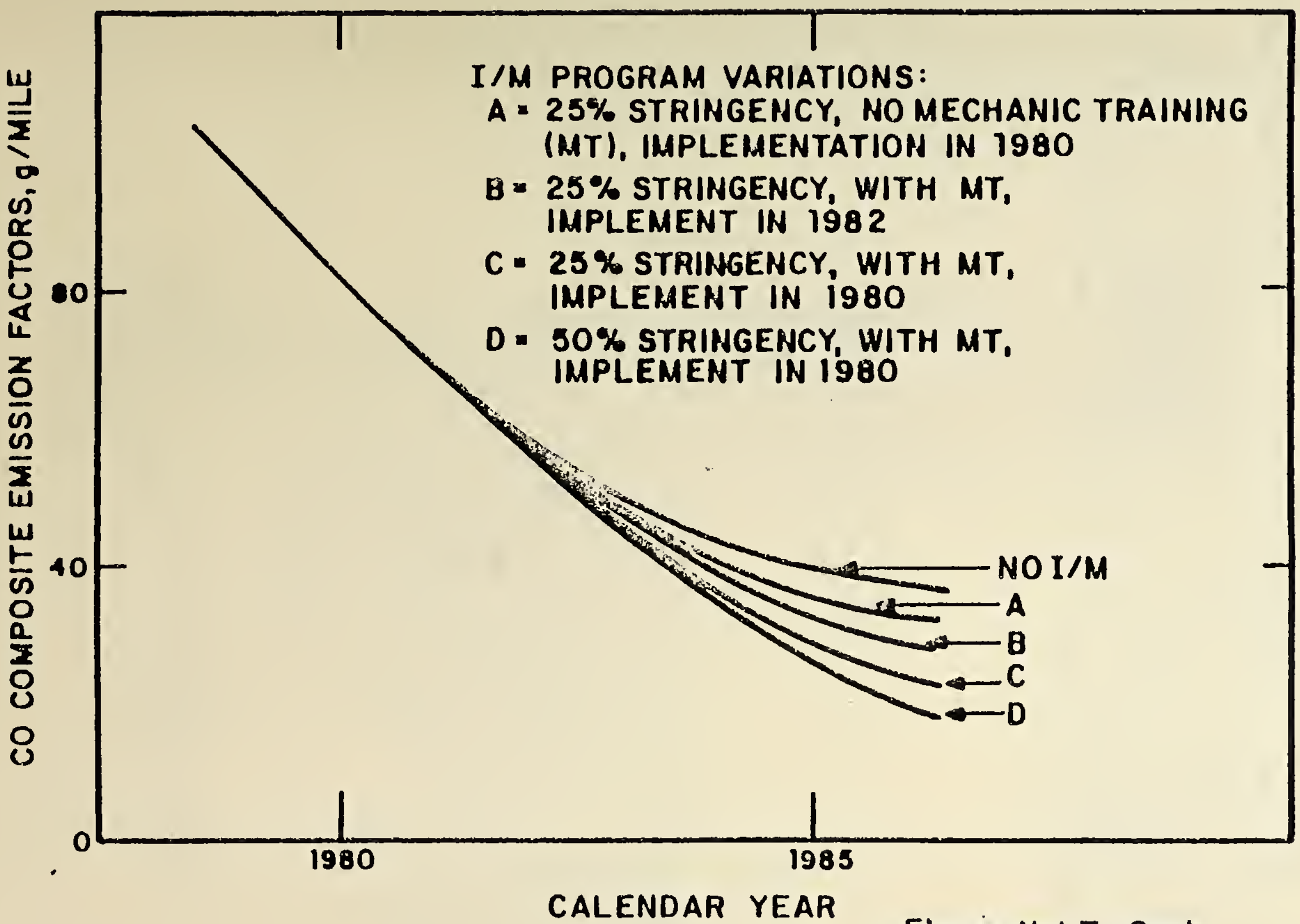


Figure Not To Scale

FIG. C.2. EFFECTS OF INSPECTION AND MAINTENANCE PROGRAM ON MOTOR VEHICLE EMISSIONS OF CARBON MONOXIDE.

time what the proposed I/M program will involve with respect to stringency of pass/fail criteria, mechanics' training, and year of implementation. For an assumed stringency factor of 25% (i.e., initial failure rate of 25%), with mechanics' training, and with implementation in 1980, reductions of CO emissions of 2% and 13% are estimated for 1982 and 1985, respectively.

Appendix L

CITY OF BOSTON

REAL PROPERTY DEPARTMENT
JOANNE A. PREVOST
Commissioner
BERNARD W. CALLAHAN
Assistant Commissioner

REAL PROPERTY DEPARTMENT
811 NEW CITY HALL
1 CITY HALL SQUARE
BOSTON, MASSACHUSETTS 02201
725-4100 725-4104

October 17, 1977

Mrs. Eugenie Beal
Executive Director
Boston Air Pollution Control Commission
City Hall
One City Hall Square
Boston, MA 02201

Dear Mrs. Beal:

Attached is an application for a parking freeze permit for a new garage planned as part of the Lafayette Place development project.

As you know, the Lafayette Place project will add 300,000 gross square feet of retail space and 400-500 hotel rooms to Boston's downtown with resulting benefits for the downtown and the City's economy. In support of the development, the Boston Real Property Department will carry out public improvements in the area, including provision of a new 900-car garage, modernization of the existing Hayward Place mechanical garage, and associated street improvements. In addition, parking spaces under the City's control will be eliminated in order to meet the freeze requirements. Possible eliminations and phasing are listed on the attached application form.

We will be pleased to answer any questions you may have about the Lafayette Place development.

Thank you for your attention.

Sincerely,

Joanne A. Prevost

Joanne A. Prevost
Commissioner

Attachments

APPENDIX C

CITY OF BOSTON AIR POLLUTION CONTROL COMMISSION

APPLICATION FOR PARKING FREEZE PERMIT

1. Name and Address of Facility: Lafayette Place Garage
Washington, Chauncy, Bedford, Hayward Place

2. Name and Address of Owner: City of Boston Real Property
Department, City Hall, Boston, Massachusetts

3. Type of Facility: Lot
one new underground garage
Garage X one rehabilitated mechanical garage

4. Type of Request	Number of Spaces Proposed * New	Existing	Total
New Facility	900	-	900
Rehabilitation of Existing Facility	600	(700)	600
			1500

5. Type of Spaces	Number	
Commercial	1082	
Residential		
Employee		
Other (describe)	418	Hotel Valet Parking
Total	1500	

	Month	Day	Year
6. Estimated Commencement	July	1	1978
Estimated Completion	July	1	1980

*Two garages are proposed. The first is a new underground garage for 900 cars on the former site of Raymond's department store. The second is a modernization of the existing 700-car mechanical garage at Hayward Place. At the present time it is proposed to have both garages open to the general public. However, one option currently under consideration is a reservation of a certain number of spaces in the rehabilitated Hayward Place Garage for the exclusive use of hotel patrons in a valet parking arrangement. The elimination of spaces in city-owned facilities will be coordinated to ensure that the freeze requirements are met.

The rehabilitated garage will hold only 600 cars, for a net loss of 100 spaces. In addition, other existing spaces will be removed in phases to accommodate the new development, as follows:

1976 Map #	Name	Lot/ Garage	#Spaces	Eliminations in Phase
152	Code Realty	Lot	64	1
151	Hayward Place	Garage	700	1
146A 146B	Raymond's	Lot	218	1
145	Boston Edison	Lot	100	2
	Total Possible Eliminations		1082	
		Phase 1	982	
		Phase 2	100	

New commercial spaces: 1082

Additional spaces under consideration to be reserved for hotel valet parking.

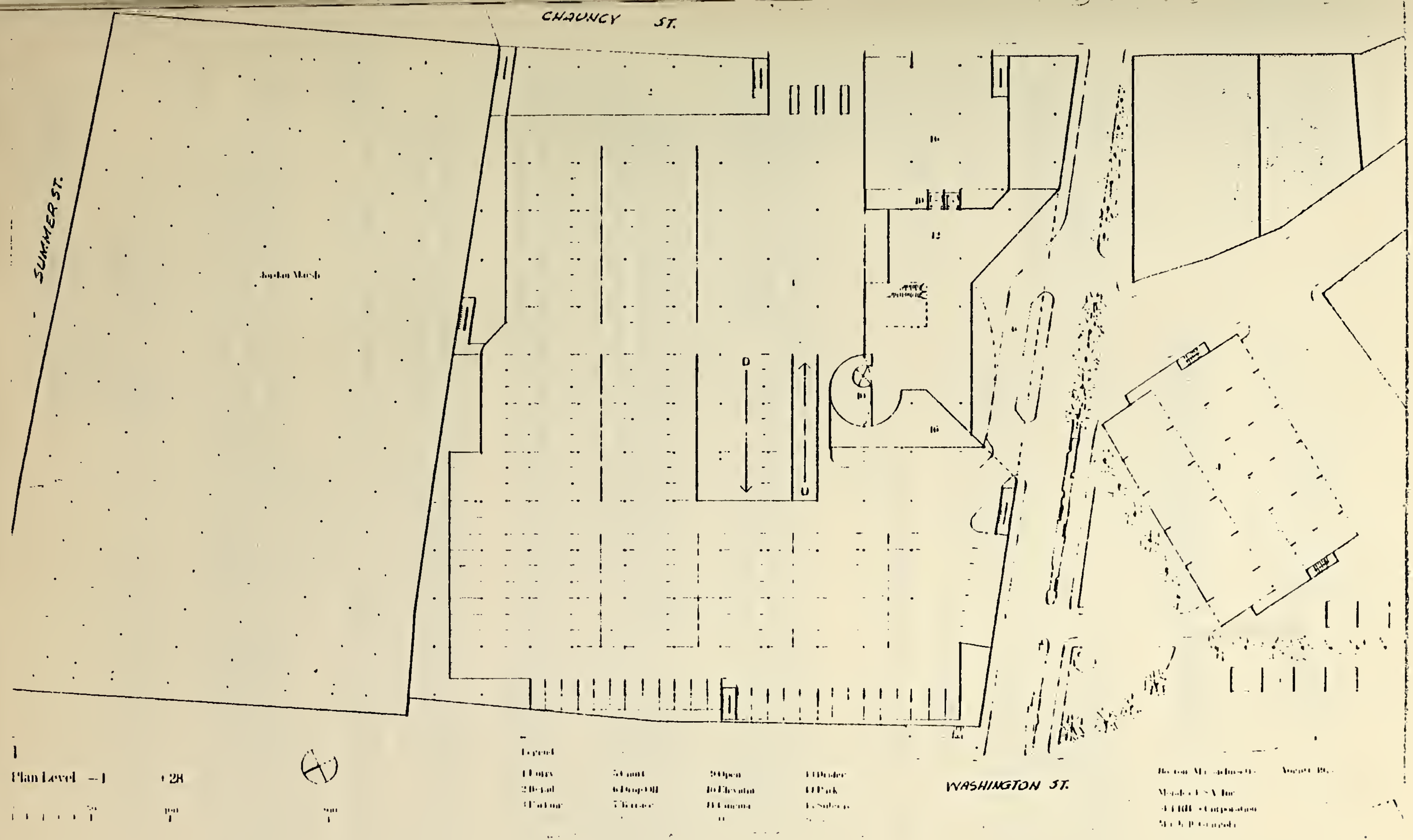
7. Please include below a general description of the need for the proposed facility and the type of development and patrons it will serve.

The two new garages will serve the planned Lafayette Place development on Washington Street, which will revitalize the downtown area through providing 300,000 square feet of new retail space, and a 400-500 room hotel.

In addition, the rehabilitation of the city-owned Hayward Place Garage, underused today because of its obsolete mechanical operations, will make more efficient use of spaces which today serve the downtown retail district.

8. Please attach a site plan or floor plan of the proposed lot or garage, showing the location of the facility, the layout of spaces, and entry and exit points.

See attachments.


CHAUNCY ST.
SUMMER ST.
WASHINGTON ST.
Jordan Marsh
D
U
Plan Level -1
+28
Legend
1 Entry
2 Retail
9 Open
10 Elevator
11 Cinema
14 Park
Boston Massachusetts
August 198-
Mondev USA Inc
[illegible] Corporation
[illegible]

CITY OF BOSTON
AIR POLLUTION CONTROL COMMISSION
Room958 Boston City Hall
725—4416

DECISION TO APPROVE APPLICATION

City of Boston
Real Property Department
Room 811, 1 City Hall Square
Boston, MA 02201

November 15, 1977

SITE LOCATION: Lafayette Place Garage

No. of SPACES APPROVED: 1500

TOTAL CAPACITY OF GARAGE: 1500

Gentlemen:

This is the Commission's decision, in accordance with the City of Boston Procedures and Criteria for Issuance of Parking Freeze Permits, as to your application for a permit at the above site location.

Based upon the criteria set forth in Section E of the City of Boston Procedures and Criteria and full consideration of all facts contained in your application and the information developed in the joint staff report and at the public hearing, the Commission has found that the garage meets all criteria in Section E of the City of Boston Procedures and Criteria. Accordingly, the Commission approves your application subject to the conditions set forth in the enclosed permit.

The enclosed permit is transferable to the final developer/ owner of said garage for the number of assigned spaces, and all conditions of said permit are binding on the transferred party, provided that no new construction or modification of said facility shall be undertaken without prior compliance with 40 CFR s. 52.1135.

Condition No. 8 of the enclosed permit is for the purpose of maximizing the Lafayette Place Garage Project's compatibility with the "Transportation and Transit Improvement Project." It is important that the design of Lafayette Place and the circulation pattern in its vicinity not close options for extension of the TTIP.

Yours truly,

Eugenie Beal

Eugenie Beal
Acting Executive Director

CITY OF BOSTON
AIR POLLUTION CONTROL COMMISSION
Room 958 Boston City Hall

Eugenie Beal
Acting Executive Director

725-4416

PARKING FREEZE PERMIT

No. 04-01

TO:

City of Boston Real Property Department
Room 811, 1 City Hall Square
Boston, MA 02201

SITE LOCATION: Lafayette Place Garage

No. of SPACES: 1500

EFFECTIVE DATES: FROM November 15, 1977 TO N.A.

This permit is issued pursuant to the authority contained in the U.S. Environmental Protection Agency's Transportation Control Plan for the Metropolitan Boston Intrastate Air Quality Control Region (40 CFR s. 52.1135), the delegation of authority to issue such permits by the Governor of the Commonwealth of Massachusetts, and the City of Boston Procedures and Criteria.

The Commission has determined that the construction or modification of this facility will be in compliance with 40 CFR s. 52.1135(c).

This permit may be revoked by vote of the Commission due to violation of any of the conditions contained herein, or of the City of Boston Procedures and Criteria.

This permit shall be prominently displayed on the premises.

CONDITIONS

1. The permittee shall comply with all applicable laws and regulations of the City of Boston, Commonwealth of Massachusetts, and 40 CFR s. 52.1135.

2. The permittee shall, within six months of the date of issuance of this permit, apply to the City of Boston Building Department for all necessary building, occupancy, or change of use permits.

3. Any construction or modification of this facility shall be carried out in accordance with the site plan and design submitted with the application, except as may be modified herein.

4. The permittee shall submit to the Commission any change in design relative to entrances or exits. The permittee shall not undertake any such construction or modification thereof unless and until approved by the Commission.

5. This permit is limited to the assigned number of spaces stated.

6. This permit shall not be transferred or assigned without prior approval of the Commission.

7. The permittee shall submit in writing 90 days prior to the opening of said facility the mechanism of elimination of spaces totaling 450 parking spaces at the Kingston/Bedford Garage and Lincoln/Essex Garage for review and approval by the Air Pollution Control Commission.

8. The exit from garage, including dropoff, on the New Street shall not be west of the Harrison Avenue Extension.

9. The rate schedule shall be structured so as to discourage commuter parking.

10. Fees for parking shall be collected before the vehicle is released to the driver.

11. The attached Memorandum to Eugenie Beal from Joanne A. Prevost is hereby incorporated into this permit.

ISSUED BY THE BOSTON AIR POLLUTION
CONTROL COMMISSION

DATE OF ISSUANCE: November 15, 1977

By the Commission,

Emily C. Lloyd, Chairperson

David Rosenbloom

Susan D. Straight

Susan D. Straight

William Noonan

William Noonan

Clark Frazier

Clark Frazier

CITY OF BOSTON

REAL PROPERTY DEPARTMENT
JOANNE A. PREVOST
Commissioner
BERNARD W. CALLAHAN
Assistant Commissioner

REAL PROPERTY DEPARTMENT
811 NEW CITY HALL
1 CITY HALL SQUARE
BOSTON, MASSACHUSETTS 02201
725-4100 725-4104

15 November 1977

Air Pollution Control Commission
Boston City Hall
Room 958
One City Hall Square
Boston, MA 02201

Gentlemen:

In furtherance of the Real Property Board's application for a 1500 space parking permit for Lafayette Place, I would like to submit the following information in connection with its impact on the Transit and Traffic Improvement Program (TTIP):

1. Bedford Street Discontinuance

   The portion of Bedford Street between Washington and Chauncy Streets will be discontinued as part of the Lafayette Place development. A new street (New Bedford) will be constructed from Kingston Street to Washington Street to accommodate westbound traffic and an exclusive bus lane as required in the TTIP.

   This new street will be no less than 33 feet wide, adequate to accommodate two (2) travel lanes and one bus lane. In addition, access from Washington Street easterly towards the hotel site will be provided.

   Chauncy Street will be widened from present Bedford Street to New Bedford Street to add one lane to the present Chauncy Street width, thereby making Chauncy Street consistent in width from Summer Street to the New Bedford Street. This widening will also allow for buses and facilitate all vehicular movements onto New Bedford Street.

2. Garage Entrances and Exits

Primary access and egress to the garage will be from Chauncy Street. In addition, secondary access and egress will be provided on New Bedford Street. The location of access and egress to/from the garage from Chauncy Street, which is in the same location as existing Bedford Street, will be controlled by signals having bus priority and pedestrian phases. In addition, removal of potential conflict between pedestrians and vehicles vis-a-vis blind driveways will be taken into consideration during the design.

The New Bedford Street entrance will not interfere with buses because the new street will be one-way westbound except for a short eastbound lane from Washington Street to the hotel site entrance.

3. Volumes Generated by Garage

Trip generation for the new 900 space and renovated 600 space parking facilities is based on 280,000 gross square feet of retail and a 450-room hotel. Using figures derived from Barton-Aschman studies for Lafayette Place and Cambridge Systematics, it is projected that a total of 500 cars will exit the two (2) parking facilities in the P.M. peak hours, or 22% of total trips.

In 1975, prior to construction of the "Raymond's lot", lots and garages in the project area generated 3,480 auto trips per day, with approximately 1,000 in the peak hour, or 28% of total in peak hour.

CITY OF BOSTON

REAL PROPERTY DEPARTMENT
JOANNE A. PREVOST
Commissioner
BERNARD W. CALLAHAN
Assistant Commissioner

REAL PROPERTY DEPARTMENT
811 NEW CITY HALL
1 CITY HALL SQUARE
BOSTON, MASSACHUSETTS 02201
725-4100 725-4104

> Based on these figures, therefore, the new parking facilities will put fewer autos onto the street system in the P.M. peak hours than the current system. This projection is predicated on the transition from commuter parking to shoppers parking to service the Lafayette Place development.
>
> It is therefore projected that the new parking facilities to be structured for the daily shoppers will in fact generate less auto traffic in the peak hours than what exists today.

The above information is the result of various meetings and discussions among the appropriate City agencies and consultants to the Real Property Board and developer. I trust that it will supplement the presentation made to you at the public hearing and will provide you with the assurances necessary to approve this much-desired public/private development. We would be happy to provide further detail as may be required.

Very truly yours,

B. Tracey Dep. Comm. For

JOANNE A. PREVOST
Chairman
Real Property Board

Bernard W Callahan

Bernard W. Callahan
Associate Commissioner

Thomas F Kelly Jr

Thomas F. Kelly, Jr.
Associate Commissioner

VMT Analysis for Lafayette Place Complex

Summary

The Lafayette Place complex, consisting of some 300,000 square feet (gross) of retail space and a 500 room hotel, together with the remodeled Jordan Marsh department store of 750,000 square feet retail area (which will be intimately tied into the Lafayette Place project), will generate approximately 8.5 million vehicle miles of travel (VMT) per year more than currently is generated by the land uses in the project area and by Jordan Marsh. This represents approximately a 0.053% increase in the Metropolitan Boston Air Quality Control Region VMT.

Assumptions

Trip generation data used in this analysis are consistent wherever possible with prior data used by Barton-Aschman Associates[1] in their work on the project. Exceptions relate to the one-way trip generation rates used for retail floor space, which were reduced from 55 per 1,000 square feet to 35 per 1,000 square feet (shoppers) and 5 per 1,000 square feet (employees). Modal split and vehicle occupancy throughout are consistent with Barton-Aschman's work. Parking activity patterns are based on BRA work developed for the cash flow analysis of the garage.

For the retail VMT analysis, detailed modal split and trip generation information was developed using as a basis the Barton-Aschman survey at Jordan Marsh on the origins of shoppers (Table 1 and Appendices 1 and 2).

---

[1] Barton-Aschman Associates, Site Analysis, Lafayette Place, Boston, Massachusetts, prepared for SEFRIUS, Developer, Washington, D.C., July 1974.

Table 1

Shopper Origins and Modal Split

Sector	All Shoppers	Modal Split to Auto Jordan Marsh	 Lafayette Place
A. Downtown Employees	11%	0%	0%
B. Boston Residents	27%	10.1%	17.5%
C. Inner MBTA Area	28%	20.2%	25%
D. Outer MBTA Area	11%	70.8%	75%
E. Balance of SMSA off MBTA	8%	91.1%	92.5%
F. Outside SMSA (tourists, convention delegates, etc.)	15%	10.1%	17.5%
Average		25%	30%

PART A

Exiting VMT

Findings

The total VMT for the current land uses on and adjacent to the site (parking facilities and the Jordan Marsh store) is estimated at 33,642,000 per year, derived as follows:

Table 2

Trip Generation - Current Land Uses

Land Use	One-Way Trips/Day
1. Parking Facilities[1]	
Hayward Place Garage	918
Code Realty lot	242
Edison lot	422
Bristol lot	558
Bedford-West lot	856
	2,996
2. Jordan Marsh Store[2]	
Shoppers	7,718
Employees	576
	8,294
less: parking trips to project site parking facilities with Jordan Marsh destination	(1,378)[3]
Total auto trips per day	9,912

---

1. Source: BRA field surveys - 1972, 1975, 1978
2. Source: Jordan Marsh survey, Barton-Aschman Associates.
3. Based on April 1978 BRA interviews of patrons of the Bristol and Bedford-West lots, 46% of the parkers indicated Jordan Marsh as their destination. It was assumed this same percentage applied similarly to the Edison and Code Realty lots and the Hayward Place garage.

Table 3

Annual VMT - Current Uses

Land Use	No. One-Way Auto Trips	Average Length	No. Days Per Year	Annual VMT
Parking Facilities[1]	1,618	10 miles	300	4,854,000
Jordan Marsh				
Shoppers[2]	7,718	4-15 miles	300	27,060,400
Employees	576	10 miles	300	1,728,000
Total	9,912			33,642,000

---

1. Excluding patrons with Jordan Marsh destination.
2. For breakdown of calculation see Appendix 1.

PART B

Future VMT

Assumptions

The new Lafayette Place complex, with a hotel and retail space, will serve much of the same market as is served by Jordan Marsh. Therefore, shopping modal split and origins and trip length are assumed to be the same as those derived from the Jordan Marsh survey (Appendices 1 and 2). Hotel trips, being in part to and from the airport and partly within the downtown area, are assumed to be shorter than average retail trips, with an average length of 4 miles. For employee trips, it was assumed generally that 10% would be made by auto, with an average length of 10 miles one-way and an occupancy of 1.3 persons per car.

Findings

The estimated total VMT for the future land uses on the site (hotel and retail space) and for the Jordan Marsh store is 43,645,000 per year, derived as follows.

Table 4

Future Land Use and Trip Generation

Land Use	Size	Trips per Unit Size	Modal Split to Auto	Vehicle Occ.	Total One-Way Trips/Day
Hotel	500 rms.				
-visitors		4.8/rm.	40%	2.0	960
-employees		1.2/rm.	10%	1.3	92
Jordan Marsh	750,000 s.f.				
-shoppers		35/1000 s.f.	24.6%	1.7	7,718
-employees		5/1000 s.f.	10%	1.3	576
Lafayette Place Retail	300,000 s.f				
-shoppers		35/1000 s.f.	30%	1.7	3,706
-employees		5/1000 s.f.	10%	1.3	230
Total					13,282

Table 5

Annual VMT - Future Uses

Land Use	No. One-Way Auto Trips	Average Length	No. Days Per Year	Annual VMT
Hotel				
- visitors	960	4 miles	365	1,401,600
- employees	92	10 miles	365	335,800
Jordan Marsh				
- shoppers[1]	7,718	4-10 miles	300	27,060,000
- employees	576	10 miles	300	1,728,000
Lafayette Place retail				
- shoppers[2]	3,706	4-15 miles	300	12,429,600
- employees	230	10 miles	300	690,000
Total	13,282			43,645,000

---

1. See Appendix 1
2. See Appendix 2

Trip Substitution

The above analysis indicates that the Lafayette Place project/Jordan Marsh will generate some 10,003,000 VMT per year more than the current land uses in the site vicinity do. However, with the attractiveness of the Lafayette Place project, it can be expected that the complex will "capture" some of the trips now made to regional shopping centers and thus lead to a reduction in regional VMT. There are relatively few competitors with the proposed complex closer than the Route 128 area (Chestnut Hill Mall, Back Bay, Faneuil Hall Markets, and the rest of the Boston CBD, i.e., Filene's and Kennedy's). Therefore, the potential for diversion to Lafayette Place is high. Its success will depend on amenities and services such as adequate pedestrian routes within the complex, seating areas for relaxation, restaurants, delivery services, late hours on weeknights, and so forth. With these amenities many regional residents will prefer to shop downtown after work or travel downtown by transit rather than drive to regional shopping centers with more traffic problems, few amenities and a smaller range of goods. The Lafayette Place/Jordan Marsh element alone without the rest of the downtown will have 1.05 million square feet of retail space, compared with Chestnut Hill (450,000 square feet), the South Shore Plaza (760,000 square feet), Burlington Mall (925,000 square feet) and the more distant Northshore Shopping Center (1.2 million square feet). Therefore, the downtown will continue to be a major regional attractor and the new center may well divert trips from other regional centers.

Estimates of regional trips which would be substituted by Lafayette Place trips are derived as follows:[1]

Downtown Office Workers

It is estimated that 1,155 nearby office workers would shop at the Lafayette Place complex daily, both at lunchtime and after work. It is reasonable to assume that some of these trips would replace trips that otherwise would be made to suburban shopping centers. For purposes of this analysis, it is assumed that Lafayette Place trips as a secondary trip purpose would substitute for 25% of the suburban shopping trips, saving an estimated 173,250 trips per year. Assuming an average one-way trip length of 5 miles for the suburban shopping trip, an estimated 866,250 VMT per year would be saved.

City Residents

As with downtown employees, the presence of Lafayette Place may induce a reduction in trips by City (especially downtown) residents to suburban shopping malls. If an estimated ten percent of the 584 auto trips to and from Lafayette Place by local residents, replace similar numbers of suburban trips with an average one-way trip length of 9 miles, then there would be a savings of 157,680 VMT per year (9 miles x 584 trips x 10% x 300 days).

Metropolitan Area Residents

Metropolitan area residents, like City and downtown residents, may substitute shopping in the core for shopping in the suburbs once Lafayette Place is open. Assuming that 25% of the metropolitan shoppers substitute 50% of their trips in this way, and assuming that the average one-way trip eliminated is 5 miles, there would be a yearly savings of 524,625 VMT (5 miles x 25% x 50% x 2,798 trips x 300 days).

Conclusions

The Lafayette Place project will generate an estimated net VMT per year of 8,454,445 more than the current land uses in the area.

---

[1] Estimates are based on assumptions derived from a 1974 BRA VMT analysis for a proposed garage in the Faneuil Hall Markets area.

Table 6

Summary Comparison of Current and Future VMT

		Annual Vehicle Trips	Annual VMT	Average Trip Length (Miles)
A.	Trips eliminated due to closure of parking facilities	485,400	4,854,000	10
B.	Jordan Marsh trips retained			
	Shoppers	2,315,400	27,060,000	4-15
	Employees	172,800	1,728,000	10
	Sub total	2,488,200	28,788,000	
C.	Future auto trips generated by:			
	Hotel visitors	350,400	1,401,600	4
	Jordan Marsh & Lafayette Place shoppers	3,427,200	39,489,600	4-15
	Employees	275,380	2,753,800	10
	Sub total	4,052,980	43,645,000	
D.	Auto trips no longer made by:			
	Downtown office workers	173,250	866,250	5
	City residents	17,520	157,680	9
	Metropolitan area residents	104,925	524,625	5
	Sub total	295,695	1,548,555	
E.	Net change in auto trips/VMT (C-[A+B+D])	+ 783,685	+8,454,445	

Appendix 1

Trip Generation and VMT Analysis
Jordan Marsh

	Shopping Split[1]	Total Shopping Trips[2]	Auto Split[3]	No. Shoppers by Auto	One-Way Auto Trips[4]	Average Trip Length[5]	Daily VMT
Downtown Employees	11%	2,890	0%	0	0	0	0
Boston Residents	27%	7,085	10.1%	716	842	4 mi.	3,368
Inner MBTA Area Residents	28%	7,350	20.2%	1,485	1,748	9 mi.	15,732
Outer MBTA Area Residents	11%	2,890	70.8%	2,047	2,408	12.5 mi.	30,300
Balance of SMSA off MBTA	8%	2,100	91.1%	1,914	2,252	15 mi.	33,780
Outside SMSA	15%	3,935	10.1%	398	468	15 mi.	7,020
		26,250		6,560	7,718		90,200

---

[1] Source: Jordan Marsh survey, Barton-Aschman Associates.
[2] Based on 35 trips per 1,000 sq.ft. retail space.
[3] Source: Jordan Marsh survey, Barton-Aschman Associates.
[4] Based on average auto occupancy of 1.7 persons per auto.
[5] BRA estimate.

Appendix 2

Trip Generation and VMT Analysis
Lafayette Place

	Shopping Split[1]	Total Shopping Trips[2]	Auto Split[3]	No. Shoppers by Auto	One-Way Auto Trips[4]	Average Trip Length[5]	Daily VMT
Downtown Employees	11%	1,155	0%	0	0	0	0
Boston Residents	27%	2,835	17.5%	496	584	4 mi.	2,336
Inner MBTA Area Residents	28%	2,940	25%	735	864	9 mi.	7,776
Outer MBTA Area Residents	11%	1,155	75%	866	1,020	12.5 mi.	12,750
Balance of SMSA off MBTA	8%	840	92.5%	777	914	15 mi.	13,710
Outside SMSA	15%	1,575	17.5%	276	324	15 mi.	4,860
		10,500		3,150	3,706		41,432

---

1 Source: Jordan Marsh survey, Barton-Aschman Associates.
2 Based on 35 trips per 1,000 sq.ft. retail space.
3 BRA estimates
4 Based on average auto occupancy of 1.7 persons per auto.
5 BRA estimate.

Appendix N

CITY OF BOSTON NOISE SURVEY, 1975[1]

Downtown Boston

D#	Location	Meas. Period	Time	L_{10}	L_{50}	L_{90}	L_{eq}	L_{eq} 24 hr.	L_{dn}
1	25 Eliot Street	Rush Hour	1718	78	69	64	73.8	74.2	76.3
		Midday	1246	78	71	66	77.7		
		Evening	2155	76	69	66	68.7		
		Night	0105	72	65	68	67.0*		
-2	Boston Common (150' on path from Soldiers & Sailors Monument)	Rush Hour	1630	58	55	53	59.9	53.8	57.7
		Midday	1230	58	55	52	55.3		
		Evening	1945	56	53	52	53.4		
		Night	0132	54	47	44	50.1*		
3	between 32 & 36 Pinkney Street	Rush Hour	1715	65	55	51	64.7	62.1	63.9
		Midday	1330	68	60	55	64.9		
		Evening	1920	56	45	44	52.2		
		Night	0228	58	41	38	54.0*		
4	29 Beach Street	Rush Hour	1648	72	65	62	70.4	70.3	74.6
		Midday	1208	73	67	63	69.2		
		Evening	2137	72	62	56	75.3		
		Night	0037	72	57	52	67.4*		
-5	48 Temple Place	Rush Hour	1700	71	68	64	70.6	66.4	67.2
		Midday	1140	70	68	65	68.3		
		Evening	2045	62	56	54	58.9		
		Night	0256	56	51	48	54.4*		
6	Somerset Street across from Pemberton Square	Rush Hour	1720	68	65	63	66.2	64.0	65.7
		Midday	1350	68	66	65	66.3		
		Evening	1900	66	63	62	64.0		
		Night	0205	58	54	54	55.4*		

* weighted for Ld_n

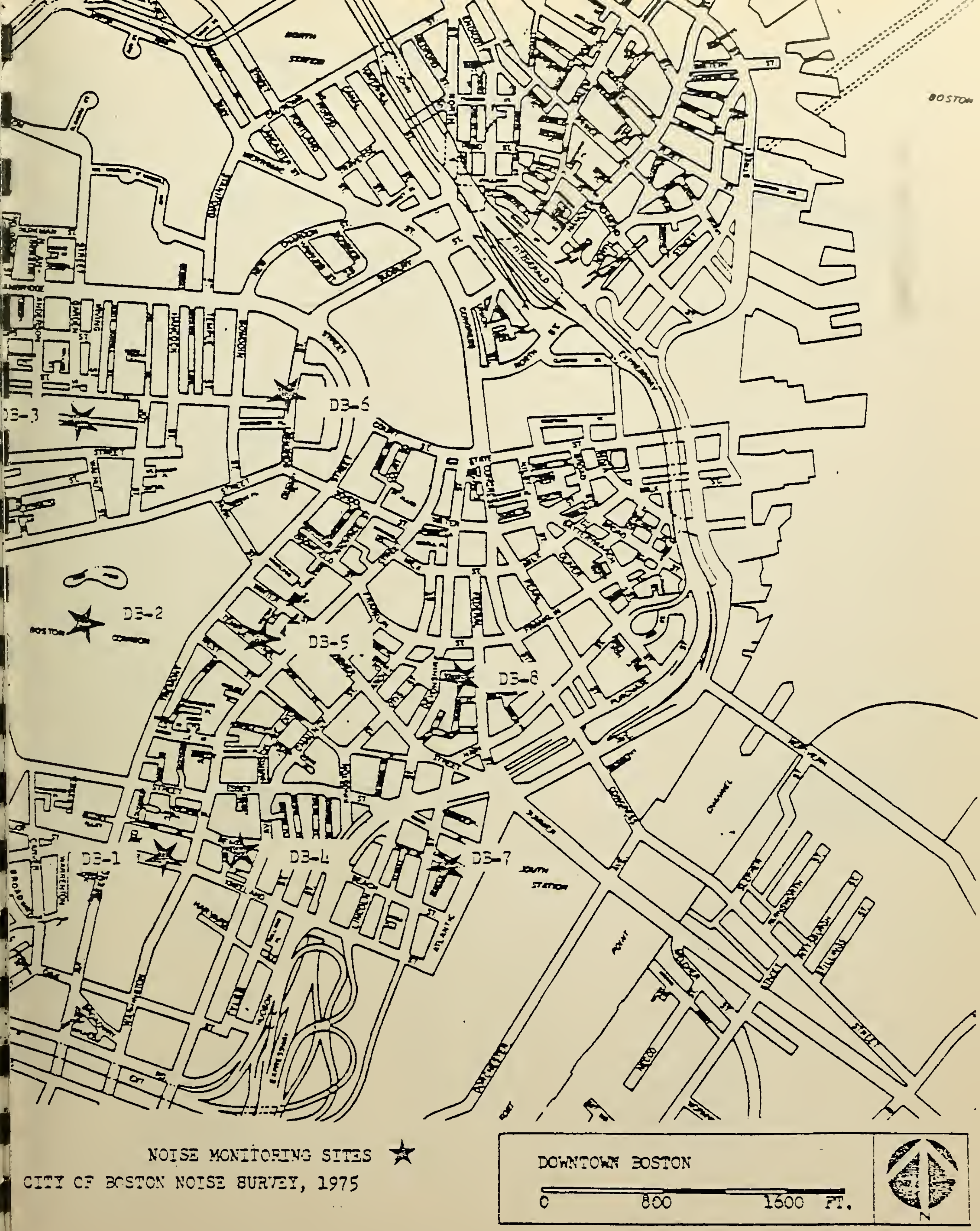
[1] City of Boston Air Pollution Control Commission

CITY OF BOSTON NOISE SURVEY, 1975

Downtown Boston

ID#	Location	Meas. Period	Time	L_{10}	L_{50}	L_{90}	L_{eq}	L_{eq} 24 hr.	L_{dn}
DB-7	9 East Street	Rush Hour	1616	69	65	61	66.8	65.9	67.9
		Midday	1134	72	76	61	69.2		
		Evening	2110	59	58	55	58.3		
		Night	0010	62	56	54	58.4*		
DB-8	75 Federal Street	Rush Hour	1600	71	64	61	66.2	63.8	67.4
		Midday	1115	68	64	62	65.9		
		Evening	2015	60	55	50	57.5		
		Night	0321	62	49	47	59.7*		
		Rush Hour							
		Midday							
		Evening							
		Night							
		Rush Hour							
		Midday							
		Evening							
		Night							
		Rush Hour							
		Midday							
		Evening							
		Night							
		Rush Hour							
		Midday							
		Evening							
		Night							

* weighted for Ld_n



NOISE MONITORING SITES ★
CITY OF BOSTON NOISE SURVEY, 1975

COMPUTER ANALYSIS - LAFAYETTE PLACE NOISE SURVEY

City of Boston Air Pollution Control Commission
3/20/78 - 3/22/78

Essex Street
11:05 a.m.-12:05 p.m.

```
    8816.          6
  321.78           I

       2.          K
    63.0           L
    89.0           H
    562.           M
10.00078           X
50.00069           X
90.00064           X
    74.6           F
```

Essex Street
4:20 - 5:20 p.m.

```
    8816.          6
  551.78           I

       2.          K
    64.0           L
    95.0           H
    565.           M
10.00075           X
50.00069           X
90.00066           X
    73.2           F
```

Washington Street,
at Bedford Street
11:10 a.m.-12:10 p.m.

```
    8816.          6
  322.78           I

       2.          K
    65.0           L
    86.0           H
    363.           M
10.00077           X
50.00070           X
90.00066           X
    73.6           F
```

Washington Street,
at Bedford Street
4:25 - 5:25 p.m.

```
    8816.          6
  322.78           I

       2.          K
    62.0           L
    89.0           H
    323.           M
10.00077           X
50.00070           X
90.00067           X
    74.5           F
```

Chaumcy Street
11:02 a.m.-12:02 p.m.

```
0.000000000
       8816.        B
       8816.        S
     320.78         I

          2.        K
        56.0        L
        96.0        H
        293.        M
    10.00076        X
    50.00066        X
    90.00059        X
        77.3        F
```

Chauncy Street
4:32 - 5:38 p.m.

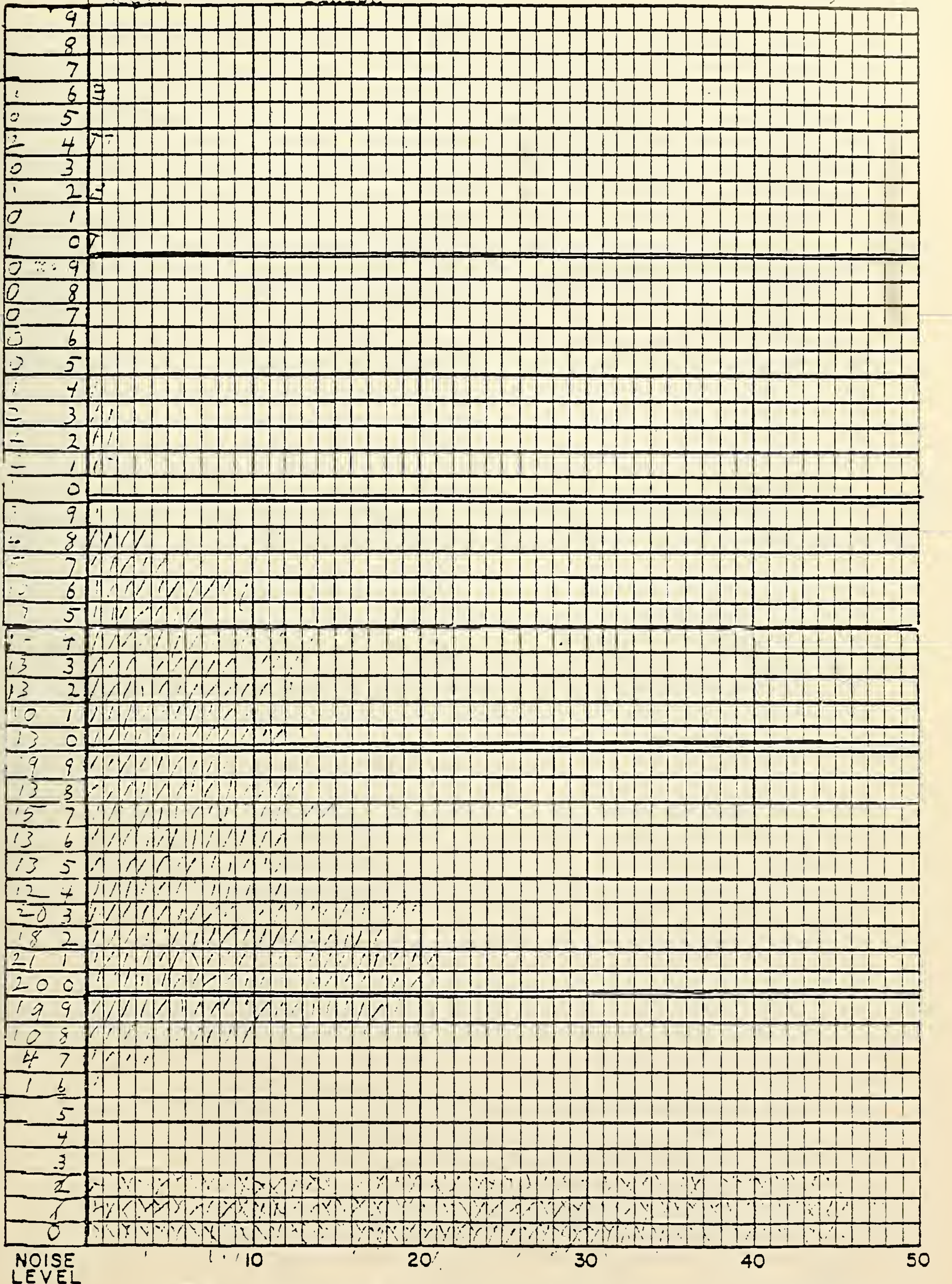
```
       8816.        B
     320.78         I

          2.        K
        57.0        L
        97.0        H
        329.        M
    10.00081        X
    50.00070        X
    90.00062        X
        80.4        F
```

:vey

et

Begin 11:02 AM Finish 12:02 PM

[illegible] Chamey [illegible]



	9
	8
	7
1	6
0	5
2	4
0	3
1	2
0	1
1	0
0	9
0	8
0	7
0	6
0	5
1	4
2	3
[illegible]	2
[illegible]	1
1	0
[illegible]	9
[illegible]	8
[illegible]	7
[illegible]	6
7	5
[illegible]	4
13	3
13	2
10	1
13	0
9	9
13	8
15	7
13	6
13	5
12	4
20	3
18	2
21	1
20	0
19	9
10	8
4	7
1	6
	5
	4
	3
	2
	1
	0

NOISE LEVEL (dBA)

293 READINGS

NUMBER OF OCCURRENCES

VEGA

NOTES AND SKETCH ON BACK

urvey
ta
heet

Begin 4:36 PM Finish 5:38 PM

On Chimney

		9
		8
	1	7
	1	6
	1	5
	3	4
	0	3
	0	2
	2	1
90	2	0
	2	9
	2	8
	2	7
	1	6
	2	5
	3	4
	1	3
	3	2
	3	1
80	3	0
	5	9
	10	8
	9	7
	14	6
	9	5
	14	4
	21	3
	20	2
	18	1
70	15	0
	15	9
	11	8
	12	7
	13	6
	14	5
	22	4
	20	3
	22	2
	12	1
60	9	0
	4	9
	4	8
	1	7
		6
		5
		4
		3
		2
		1
50		0

10 20 30 40 50

NOISE LEVEL (dBA)

331 READINGS

NUMBER OF OCCURRENCES

VEGA

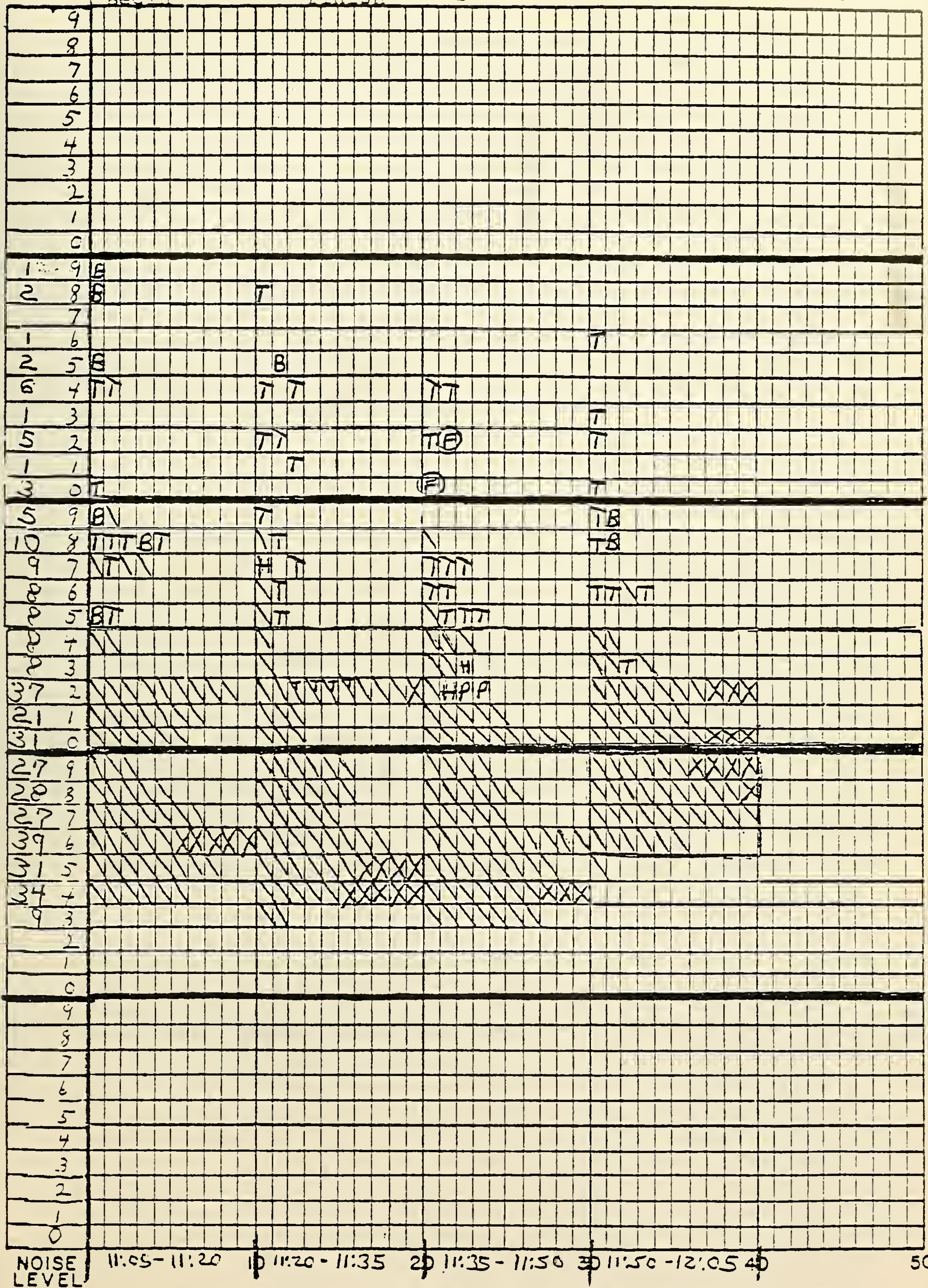
NOTES AND SKETCH ON BACK

vey,

et

ST. & HARRISON
AVE. EXTENSION ESSEX ST.

Begin 11:05 AM Finish 12:05 PM



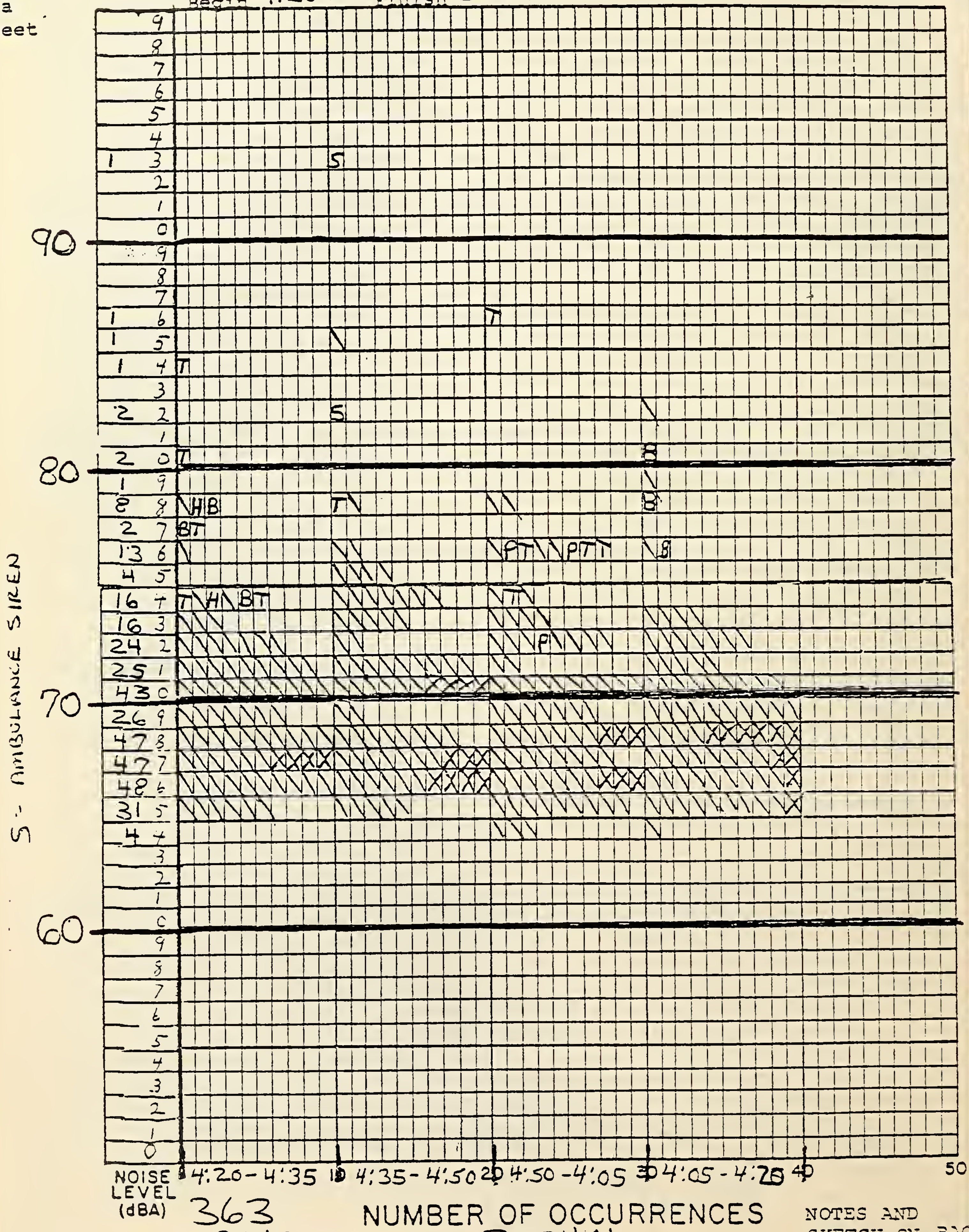
362 NUMBER OF OCCURRENCES
READINGS BCEHM

NOTES AND SKETCH ON BACK

urvey
ta
heet

Begin 4:20 PM Finish 5:20 PM

AVE. EXTENSION. Essex



363 READINGS

BOEHM

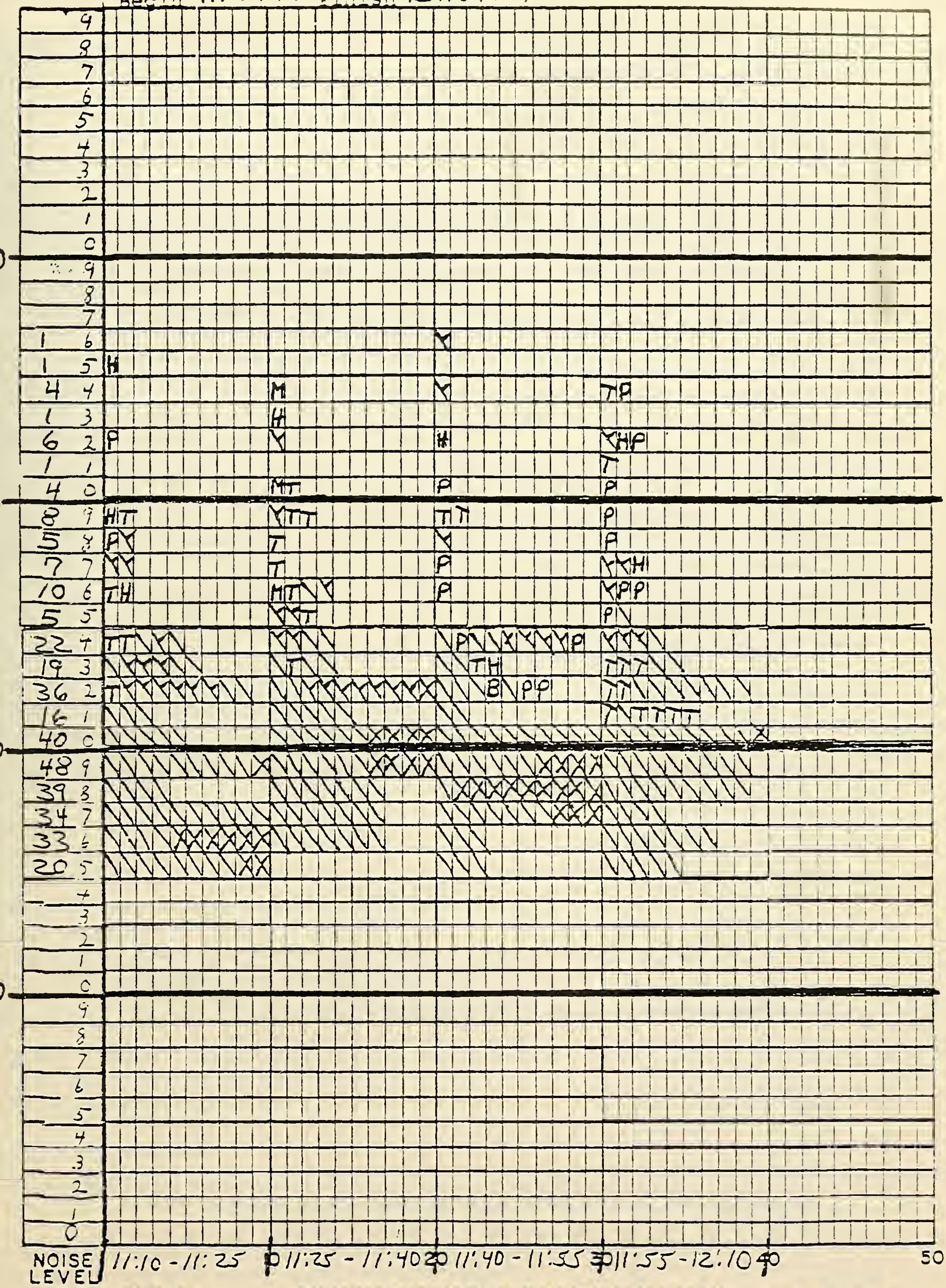
NOTES AND SKETCH ON BAC

urvey

et

WASH. ST., SOUTH OF BEDFORD

Begin 11:10 AM Finish 12:10 PM.



1	6
1	5
4	4
1	3
6	2
1	1
4	0
8	9
5	8
7	7
10	6
5	5
22	4
19	3
36	2
16	1
40	0
48	9
39	8
34	7
33	6
20	5

H = HORN S = SIREN ✓ = CAR OR MUFFLER

360 READINGS

NUMBER OF OCCURRENCES

BOEHM

NOTES AND SKETCH ON BACK

urvey-
ta
heet

South of Bedford -

Begin 4:25 PM Finish 5:25 PM

P - Plane
H - horn

		9
		8
		7
		6
		5
		4
		3
		2
		1
90		0
	1	9
	1	8
	0	7
	2	6
	1	5
	2	4
	1	3
	2	2
	3	1
80	1	0
	3	9
	10	8
	10	7
	15	6
	19	5
	19	4
	18	3
	23	2
	27	1
70	44	0
	40	9
	25	8
	21	7
	19	6
	8	5
	2	4
	2	3
	1	2
		1
60		0
		9
		8
		7
		6
		5
		4
		3
		2
		1
		0

NOISE LEVEL (dBA)

10 20 30 40 50

NUMBER OF OCCURRENCES

323 READINGS

VEGA

NOTES AND SKETCH ON

PLANNING ENGINEERING & DEVELOPMENT

SHEET ONE OF THREE SHEETS

INT. NO.

CITY Boston CBD
INTERSECTION See Below
DATE See Below DAY OF WEEK See Below

INTERSECTION TURNING MOVEMENT COUNT

Vehicle Classification Counts

P = Passenger Vehicle
T1 = Light truck or pick-up/single rear tires & axle
T2 = Medium truck/dual rear tires & single rear axle
T3 = Heavy truck/dual rear axles
T4 = Semi-trailer
B = Bus

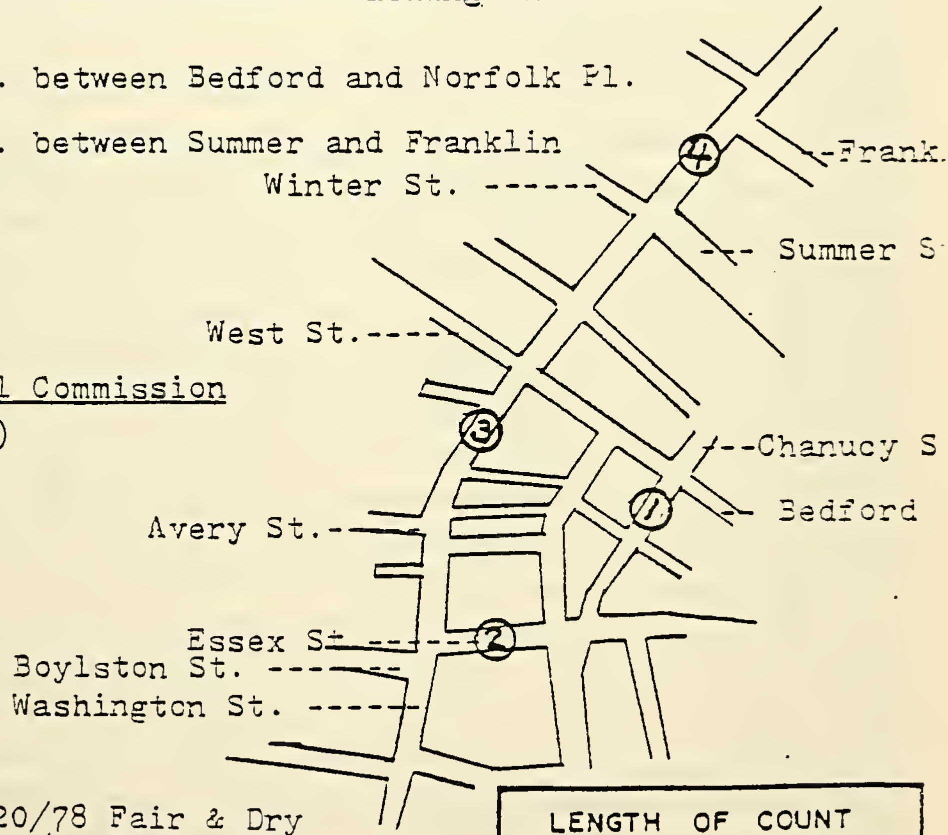
VEHICLES COUNTED	
* ALL	X
PASS. CARS	
TRUCKS	(X)

Count No. 1 #2322BRA Chauncy Street between Bedford & Rowe Place

Count No. 2 #2323BRA Essex Street between Washington and Harrison

Count No. 3 #2324BRA Washington St. between Bedford and Norfolk Pl.

Count No. 4 #2325BRA Washington St. between Summer and Franklin



Boston Air Pollution Control Commission

Jeff Boehme @ 725-4416 (9am)

WEATHER

Fair & Dry

#1 Mon 3/20/78 Fair & Dry
#2 Tue 3/21/78 Fair & Dry
#3 Wed 3/22/78 Fair & Dry
#4 Thur 3/23/78 Fair & Dry

COUNT TAKEN BY

Walter Cody

LENGTH OF COUNT	
TIME	NUMBER OF HOURS
* 11am-6pm	7 hours

STREET	ENTERING VOLUME	FLOW PERCENT	COMMENTS
Chauncy St. #1	1811		
Essex St. #2	3478		
Washington St. #3	3638		
Washington St. #4	4448		
TOTAL			

PLANNING ENGINEERING & DEVELOPMENT

SHEET TWO OF THREE SHEETS

TRAFFIC MOVEMENT SUMMARY TABLE

LOCATION See Below CITY OR TOWN Boston CBD

DATE 3/20&21/78 DAY OF WEEK Mon-Tue WEATHER Fair&Dry RECORDER W.C.

* #2322BRA * #2323BRA

TIME STARTS __ M	#1 Chauncy Street between Bedford & Rowe Place						#2 Essex Street Between Washington & Harrison						TOTAL HALF HOU TALLY
	P	T1	T2	T3	T4	B	P	T1	T2	T3	T4	B	
7:00-7:30													
7:30-8:00													
8:00-8:30													
8:30-9:00													
9:00-9:30													
9:30-10:00													
10:00-10:30													
10:30-11:00													
11:00-11:30	80	12	9	1	1	2	155	30	20	0	0	5	
11:30-12:00	103	11	6	0	3	2	174	44	20	0	2	1	
12:00-12:30	112	16	12	0	2	3	194	29	21	0	1	1	
12:30-1:00	75	13	6	0	1	3	180	29	12	0	0	2	
1:00-1:30	88	26	14	0	0	2	167	28	9	0	0	1	
1:30-2:00	105	16	12	1	4	3	204	42	18	0	0	2	
2:00-2:30	75	13	9	0	2	5	229	44	18	0	0	1	
2:30-3:00	90	22	7	0	3	4	197	40	16	1	1	2	
3:00-3:30	96	5	8	0	3	8	251	42	10	0	0	1	
3:30-4:00	84	6	7	0	0	7	206	36	14	1	0	2	
4:00-4:30	91	12	2	0	0	11	216	25	8	1	2	1	
4:30-5:00	100	12	7	0	0	13	235	28	3	0	2	1	
5:00-5:30	165	7	2	0	1	25	215	15	2	0	0	3	
5:30-6:00	137	10	4	0	0	14	202	11	4	0	0	1	
6:00-6:30													
6:30-7:00													
7:00-7:30													
7:30-8:00													
8:00-8:30													
8:30-9:00													
9:00-9:30													
9:30-10:00													
10:00-10:30													
10:30-11:00													
TOTAL	1401	181	105	2	20	102	2825	443	175	3	8	24	GRAN TOTA
TOTAL OF L.S & R	1811						3478						

TRAFFIC MOVEMENT SUMMARY TABLE

LOCATION See Below CITY OR TOWN Boston CBD

DATE 3/22&23/78 DAY OF WEEK Wed-Thur WEATHER Fair&Dry RECORDER W.C.

#2324BRA #2325BRA

TIME STARTS __ M	#3 Washington St. between Bedford St. & Norfolk Place						#4 Washington St. between Summer and Franklin Streets						TOTAL HALF HOURL TALLY
	P	T1	T2	T3	T4	B	P	T1	T2	T3	T4	B	
7:00-7:30													
7:30-8:00													
8:00-8:30													
8:30-9:00													
9:00-9:30													
9:30-10:00													
10:00-10:30													
10:30-11:00													
11:00-11:30	128	20	7	0	0	0	269	36	18	0	2	0	
11:30-12:00	225	22	9	0	1	1	258	48	17	1	1	0	
12:00-12:30	231	12	7	1	0	0	256	29	11	0	0	0	
12:30-1:00	212	25	10	1	1	0	256	32	7	2	1	0	
1:00-1:30	235	28	10	1	1	1	284	34	12	0	0	0	
1:30-2:00	218	24	6	0	0	0	241	30	19	0	0	0	
2:00-2:30	238	32	9	0	0	0	277	39	11	0	3	0	
2:30-3:00	227	29	4	0	0	0	264	30	9	0	1	0	
3:00-3:30	227	22	4	0	0	1	261	40	15	0	2	0	
3:30-4:00	253	26	8	0	0	0	262	29	2	0	0	0	
4:00-4:30	250	17	2	0	0	0	315	39	7	0	0	0	
4:30-5:00	274	7	3	0	0	0	305	28	7	1	0	0	
5:00-5:30	271	17	2	0	0	0	308	12	6	1	0	0	
5:30-6:00	261	14	0	1	0	2	287	19	3	1	0	0	
6:00-6:30													
6:30-7:00													
7:00-7:30													
7:30-8:00													
8:00-8:30													
8:30-9:00													
9:00-9:30													
9:30-10:00													
10:00-10:30													
10:30-11:00													
TOTAL	3250	295	81	4	3	5	3843	445	144	6	10	0	GRAND TOTAL
TOTAL OF L.S B R	3638						4448						

Appendix P

Evaluation of Noise Levels According to Traffic Characteristics[1]

Site: Summer Street, between Chauncy and Kingston Streets

Time: 3:47 p.m. - 4:47 p.m., 4 May 1978

Traffic Characteristics:

360	automobiles
28	buses
15	trucks
2	motorcycles
378	vehicles

Noise Levels (dB(A)):

Measured		Adjusted, without trucks and buses	
L_{10}	78	L_{10}	75
L_{50}	71	L_{50}	71
L_{90}	67	L_{90}	67
L_{eq}	75	L_{eq}	72

---

[1] Measurements and analysis by Boston Air Pollution Control Commission.

Appendix Q

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF WATER POLLUTION CONTROL
METROPOLITAN REGIONAL OFFICE

BOSTON HARBOR SURVEY - 1972

STATION NO. 8 - Deer Island - White "A" Gong Buoy

Sample No.	R54780	R55074	R55170	R55206	R55343	R55981
Date of Collection	6/5/72	7/14/72	7/20/72	7/26/72	8/3/72	11/2/72
Time of Collection	11:40 AM	7:55 AM	3:20 PM	10:17 AM	11:02 AM	3:30 PM
Temperature (F°)	52°	53°	62°	62°	-	49°
Low Tide	12:11 PM	8:31 AM	1:22 PM	6:01 AM	12:14 PM	2:39 PM
BOD	0.8	2.0	3.9	2.3	2.1	5.0
pH	7.3	7.6	8.0	8.1	8.2	7.2
Alkalinity-Total	96	177	120	117	100	125
D.O.	4.3	4.2	8.2	-	8.4	7.6
Chlorides	15,400	15,400	15,800	16,200	10,200	16,800
Total Solids	-	-	-	-	-	-
Susp. Solids-Total	9	-	-	-	-	-
Loss	-	-	-	-	-	-
Total P	0.16	0.15	0.18	0.10	0.30	0.32
Coliform-Total	4600	2300	230	430	230	4300
Fecal	930	930	91	36	<36	930
Color	18	22	12	20	20	0
Turbidity	1	1	0	0	1	2
Total-Kj-N	0.4	3.8	1.0	0.4	-	-
Ammonia-N	0.07	0.25	0.12	0.19	0.14	0.61
Nitrite-N	-	-	-	-	-	-
Nitrate-N	0.0	0.0	0.0	0.0	0.0	0.0

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF WATER POLLUTION CONTROL
METROPOLITAN REGIONAL OFFICE

BOSTON HARBOR SURVEY - 1972

STATION NO. 8 - Deer Island - White "A" Gong Buoy

Sample No.	R55993					
Date of Collection	11/3/72					
Time of Collection	10:35 AM					
Temperature (F°)	45°					
Low Tide	3:24 PM					
BOD	1.0					
pH	7.5					
Alkalinity-Total	126					
D.O.	6.6					
Chlorides	18,000					
Total Solids	-					
Susp. Solids-Total	-					
Loss	-					
Total P	0.14					
Coliform-Total	2300					
Fecal	230					
Color	10					
Turbidity	0					
Total-Kj-N	-					
Ammonia-N	0.26					
Nitrite-N	-					
Nitrate-N	0.0					

COMMONWEALTH OF MASSACHUSETTS

DIVISION OF WATER POLLUTION CONTROL

METROPOLITAN REGIONAL OFFICE

BOSTON HARBOR SURVEY - 1972

STATION NO. 39 - Boston - Fort Point Channel - Mouth of Channel

Sample No.	R54939	R55111	R55471	R55715	R55878	
Date of Collection	6/20/72	7/18/72	8/15/72	9/12/72	10/17/72	
Time of Collection	2:20 PM	10:55 AM	11:40 AM	10:15 AM	10:25 AM	
Temperature (F°)	-		-	-	56°	
Low Tide	1:15 PM	11:37 AM	10:07 AM	8:47 AM	12:24 PM	
BOD	2.8	2.7	3.4	2.6	2.8	
pH	7.8	7.6	7.7	7.7	7.7	
Alkalinity-Total	84	108	102	107	103	
D.O.	3.8	6.2	6.2	1.3	4.2	
Chlorides	10,800	14,000	15,800	15,400		
Total Solids	-	-	-	-	-	
Susp. Solids-Total	6.5	1.5	-	1.5	1.0	
Loss	-	-	-	-	-	
Total P	0.30	0.16	0.10	0.18	0.18	
Coliform-Total	460,000	150,000	24,000	-	240,000	
Fecal	460,000	93,000	2400	-	93,000	
Color	45	20	15	18	10	
Turbidity	1	1	1	1	0	
Total-Kj-N	2.2	1.0	-	-	-	
Ammonia-N	0.38	0.5	0.31	0.26	0.38	
Nitrite-N	-	-	-	-	-	
Nitrate-N	0.1	0.0	0.0	0.0	0.0	

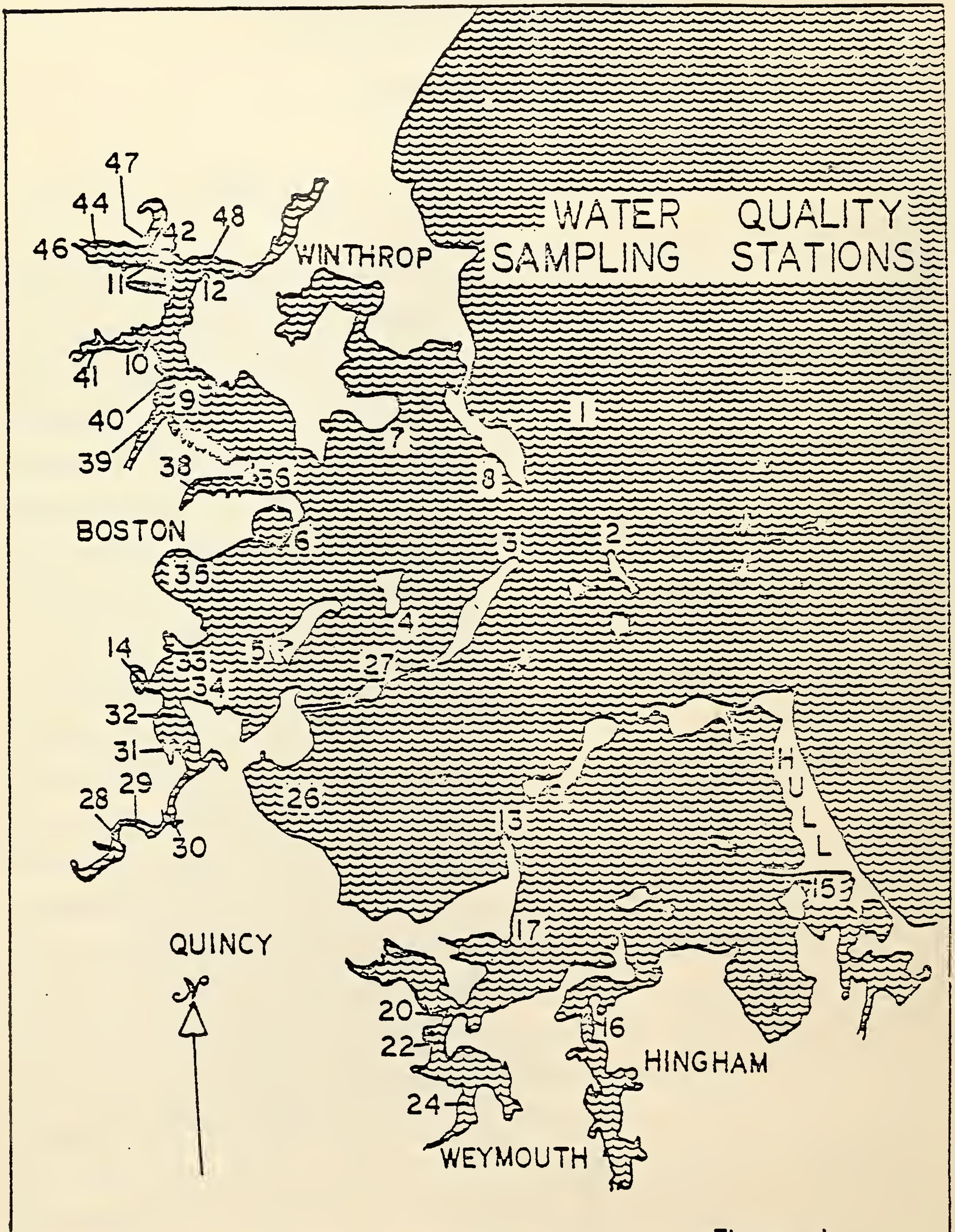

WATER QUALITY SAMPLING STATIONS
47
44
42
48
46
WINTHROP
11
12
10
41
40
9
1
7
39
38
36
8
BOSTON
6
3
2
35
4
14
33
5
37
27
34
32
31
29
28
30
26
13
HULL
15
17
QUINCY
N
20
16
22
HINGHAM
24
WEYMOUTH

Figure 1

Solid Waste Generation Estimates[1]

Lafayette Place

Hotel Guests

500 rooms @ 70% occupancy and 1.5 guests per room = 525 guests.
525 guests @ 2.4 lbs/capita/day = 12,600 lbs.

Employees

1,141 employees @ .9 lbs/capita/day = 1,030 lbs.

Transient (visitors and shoppers)

10,500 daily average @ .9 lbs/capita/day = 9,450 lbs.

Special Wastes

Street refuse:	.33 lbs./capita/day @ est. 12,170 daily population = 4,015 lbs.
Sewage residue:	.15 lbs./capita/day @ est. 12,170 daily population = 1,825 lbs.

Total daily solid waste = 28,920 lbs.
= 14.46 tons

Total annual waste = 14.46 tons x 365 days
= 5,278 tons

---

[1] Estimates based on:

(a) Smith, F.A., Comparative Estimates of Post-Consumer Solid Waste, (EPA/530/SW-148), U.S Environmental Protection Agency, Washington, May, 1975.

(b) U.S. Department of Housing and Urban Development, Region IX, Final Environmental Impact Statement...for Yerba Buena Center Redevelopment Area, Project No. Calif. R-59, San Francisco, October 1974, Appendix 1_1.

Appendix S

The Commonwealth of Massachusetts

PAUL GUZZI
Secretary of the Commonwealth

STATE ARCHEOLOGIST
BRONSON MUSEUM 8 NORTH MAIN STREET
ATTLEBORO, MASSACHUSETTS 02703
(617) 222-5470

April 5, 1978

Boston Redevelopment Authority
1 City Square
Boston, Massachusetts 02201

Att. Mr. Richard B. Mertend
Environmental Review Officer

Dear Mr. Martens :-

I have your letter of March 13th, in regard to the Layayette Place Project. I would call to your attention a discovery made in the 1940's of an ancient Indian fishweir beneath Boylston Street between Berkeley and Clarendon streets and reported in "The Boylston Street Fishweir" by Frederick Johnson (Foundation for Am. Arch., Phillips Academy, Andover, Ma.)

This report describes an Indian fish weir which was found at a depth of some 30 feet and was dated ca 5,000 B.P.

I enclose a map showing the relation of this site to the present project and call attention to the contours which existed in the 18th century. It might be possible that something of this nature would be encountered in the present project.

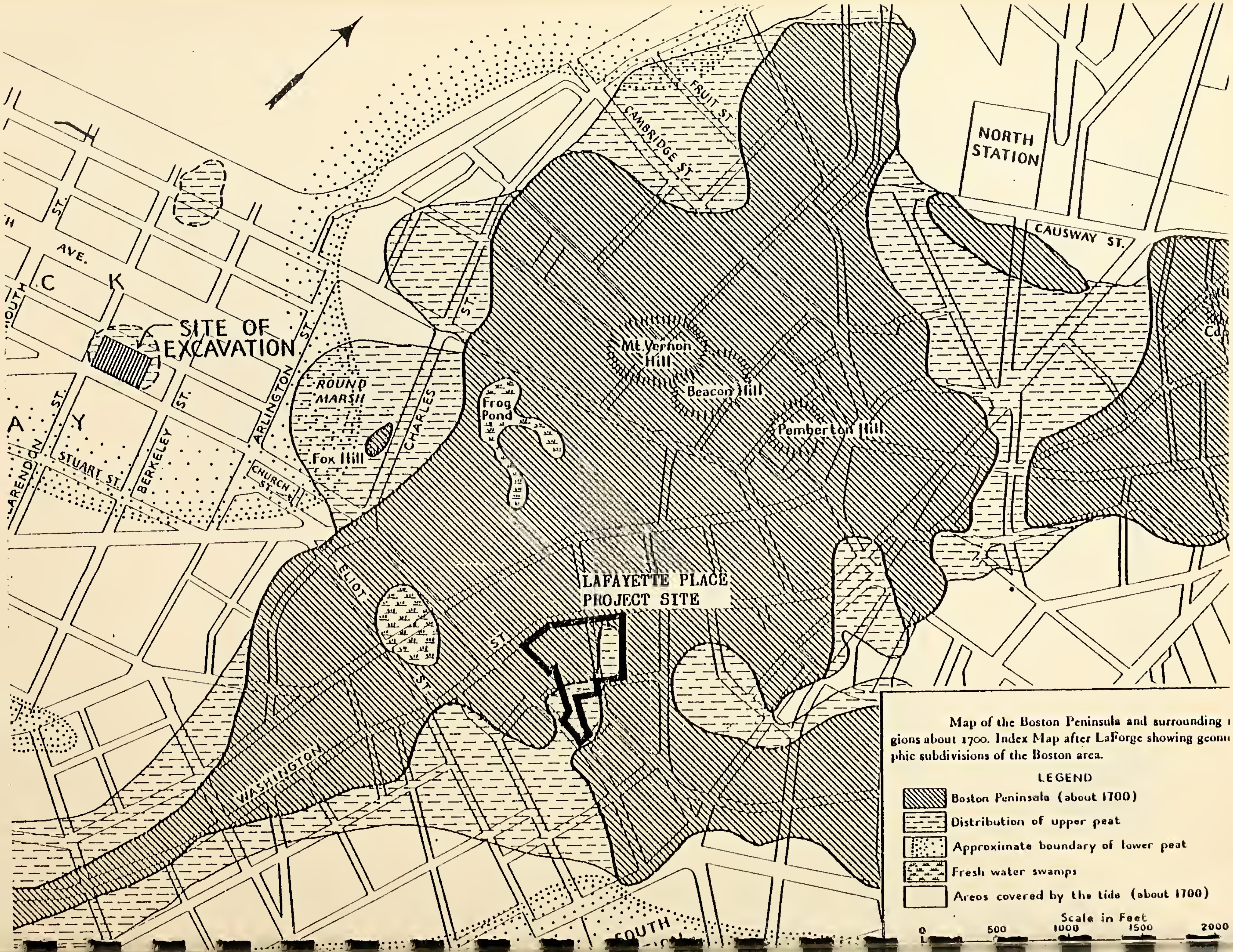
It would not be feasible to suggest an archaeological survey to determine this possibility. However, it might be wise to retain an archaeologist to check on the excavations if they reach the depth of the upper or lower peat as shown on the map.

Thank you for calling my attention to this project.

very truly yours

Maurice Robbins
State Archaeologist

MR/clr
encl.



Map of the Boston Peninsula and surrounding r
gions about 1700. Index Map after LaForge showing geom
phic subdivisions of the Boston area.

Appendix T

CITY OF BOSTON
OFFICE OF THE MAYOR
CITY HALL, BOSTON

KEVIN H. WHITE
MAYOR

Mr. John D. McDermott, Director
Office of Compliance and Review
Advisory Council on Historic Preservation
1522 K Street, N.W.
Washington, D.C. 20005

Dear Mr. McDermott:

Re: Community Development Block Grant Program - Urban Development Action Grant Program - City of Boston, Massachusetts Lafayette Place Development Project

Pursuant to Section 106 of the National Historic Preservation Act of 1966 and HUD's Environmental Review Procedures for the Community Development Block Grant Program (24 CFR Part 58), the City of Boston has reviewed with the Massachusetts State Historic Preservation Officer the proposed Lafayette Place retail/hotel/parking development project in Downtown Boston to determine if the proposed activity would have an effect on properties listed on, or eligible for inclusion in, the National Register of Historic Places. The proposed project, described below, is located adjacent to the Washington Street Theatre District, a district voted eligible for National Register listing by the Massachusetts Historical Commission. The City has made application to the Department of Housing and Urban Development for an $8,000,000 Urban Development Action Grant to fund a portion of this project.

The proposed Lafayette Place development project represents a $72 million public and private investment program in the center of Downtown Boston and encompasses a major retail/hotel complex, a new City garage, and ancilliary public improvements. The project area, extending generally from Washington Street to Chauncy and Essex Streets and from Avon Street to Hayward Place and Exeter Place, contains approximately 6 acres of predominantly vacant property. Under current plans, approximately 1,000,000 sq.ft. of space is proposed to be developed. The program's goal is to rejuvenate the retail area along Washington Street and foster round-the-clock activity in the core of downtown Boston. Key components of the Lafayette Place project include:

(1) A 300,000 square feet retail center along Washington Street, containing speciality shops, boutiques, and theatres. Three stories in height, the major feature of the center will be a large circular public space in the middle of the complex, some 100 feet in diameter,

open to the sky and landscaped. Large and small stores would line the interior space at the street level and second floor and theatres would be located on the third level. The retail center would connect directly to an adjacent department store.

(2) A 500-room high quality hotel tower appproximately 35 stories in height. The hotel would be built above the retail center on Chauncy Street and would directly overlook the circular public space. The lower levels of the hotel would connect to the retail center and would contain the lobby and function rooms.

(3) 1,500 parking spaces to be provided by the City of Boston, including a 900-car underground garage in three levels beneath the retail center - hotel complex and renovation of the existing Hayward Place garage for 600 cars. Existing parking lots in front of the Hayward Place garage would be converted into a plaza-like setting.

(4) Construction of a new east-west arterial street to facilitate the movement of vehicles to and from the project area and to provide access to the garage. This street would also replace the function of Bedford Street, to be discontinued by the development.

(5) Related project and other street improvements, including plaza construction, landscaping, street improvements, and sidewalk widening to create a pleasant pedestrian environment. In addition, a public interior pedestrianway will connect the two shopping levels of the project to the adjacent Jordan Marsh department store and the Washington Street subway station.

UDAG funds will be used to acquire a portion of the property required for this development and for the construction of the new east-west arterial street and for other street improvements. The remaining public investment for additional property acquisition, demolition of vacant buildings on the site, garage construction and renovation, and project and site improvements will be fiananced from General Obligation and Revenue Bonds. The retail and hotel complex will be privately financed.

Upon review of the proposed project, the City of Boston in consultation with the State Historic Preservation Officer, finds, under Section 800.4(2)(d), no adverse effect of the undertaking, conditioned upon review of the final plans for the development by the SHPO. The City and SHPO hereby requests the concurrence of the Advisory Council.

To guide you in the review of this proposed project, we are submitting to you, with this letter, schematic drawings and photographs of the project model. A description of the Washington Street Theatre Distirct is attached also.

Your expeditious review of this project would be appreciated. If there are any questions in regard to this proposal, please contact Mr. Richard Mertens, Environmental Review Officer, at (617) 722-4300.

Sincerely,

Kevin H. White
Mayor

Concurrence:

Patricia L. Weslowski

Patricia L. Weslowski
State Historic Preservation Officer

Appendix U

MEMORANDUM

TO: Richard Mertens

FROM: Marcia Myers

DATE: December 2, 1977

SUBJECT: Lafayette Place

As you requested, a review has been made of the existence of any properties which are listed in or eligible for the National Register of Historic Places which could be affected by the proposed Lafayette Place development.

The Lafayette Place development project will have an effect on two potentially eligible National Register districts. First, the Washington Street Theatre District abuts the Lafayette Place boundary along Washington Street; this District is presently awaiting approval by the Massachusetts Historical Commission. The effects would be multiple, but not necessarily adverse. Short term adverse effect would be during the construction phase and therefore mitigated at the end of that phase; shadow effects could be considered of an adverse nature on the richly detailed facades of this theatre grouping. Long term effects of a non-physical nature of this intensive development may assist the operations in the District's structures to prosper and therefore to preserve the structures.

Second, a district informally called the Commercial Palace District abuts Lafayette Place at Bedford Street. Formal nomination has not been undertaken yet. Similar long and short term effects as with the Washington Street Theatre District may occur. No parcels within the project would qualify for National Register listing.

M/001/M2

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
BUREAU OF AIR QUALITY CONTROL

Room 320
600 Washington Street
Boston, Massachusetts 02111

REGULATIONS

AS AMENDED

FOR

THE CONTROL OF AIR POLLUTION

IN THE

BERKSHIRE AIR POLLUTION CONTROL DISTRICT

CENTRAL MASSACHUSETTS AIR POLLUTION CONTROL DISTRICT

MERRIMACK VALLEY AIR POLLUTION CONTROL DISTRICT

METROPOLITAN BOSTON AIR POLLUTION CONTROL DISTRICT

PIONEER VALLEY AIR POLLUTION CONTROL DISTRICT

SOUTHEASTERN MASSACHUSETTS AIR POLLUTION CONTROL DISTRICT

Adopted under the provisions of Section 142D, Chapter 111, General Laws, as inserted by Chapter 836 of the Acts of 1969

Adopted to become effective June 1, 1972
and
Amended to become effective September 1, 1972
and
Amended June 17, 1977

REGULATION 9 Dust, Odor, Construction, and Demolition
(Amended September 1, 1972)

9.1 U No person having control of any dust or odor generating operations such as, but not limited to asphalt batching plants, asphalt roofing materials manufacturing plants, asphalt blowing plants, foundries, chemical products manufacturing plants, incinerators, fuel utilization facilities, petroleum products manufacturing plants, aggregate manufacturing plants, food preparation or processing facilities, wood products plants, dry cleani establishments, paint and varnish manufacturing plants, paper manufacturing plants, leather manufacturing plant concrete batching plants, metal coating and treating plants, land clearing operations, construction work, dump operations, agricultural operations and street sweeping shall permit emissions therefrom which cause or contribute to a condition of air pollution.

9.2 U No person responsible for any construction or demolition of an industrial, commercial, or institutional building or residential building with twenty or more dwelling units, shall cause, suffer, allow, or permit emissions therefrom which cause or contribute to a condition of air pollution. Said person shall notify the Department in writing twenty days prior to the initiation of said construction or demolition operation.

The twenty day advance notice period will be waived in the event of emergency demolition necessary to prevent a public health or safety hazard.

9.3 U No person responsible for an area where construction or demolition has taken place shall cause, suffer, allow, or permit particulate emissions therefrom to cause or contribute to a condition of air pollution by failure to seed, pave, cover, wet, or otherwise treat said area to prevent excessive emissions of particulate matter.

9.4 U No person shall cause, suffer, allow, or permit the handling, transportation, or storage of any material in a manner that results or may result in emissions therefrom which cause or contribute to a condition of air pollution.

9.5 U No persons responsible for any construction or demolition of a structure that contains friable asbestos material shall fail to comply with Regulations 9.2 and 2.5.6 (National Emission Standards for Hazardous Pollutants).

9.6 U Regulations 9.1, 9.2, 9.3 and 9.4 are subject to the enforcement provisions specified in Regulation 52.1

REGULATION 10. Noise

10.1 No person owning, leasing, or controlling a source of sound shall willfully, negligently, or through failure to provide necessary equipment, service, or maintenance or to take necessary precautions cause, suffer, allow, or permit unnecessary emissions from said source of sound that may cause noise.

10.2 Regulation 10.1 shall pertain to, but shall not be limited to, prolonged unattended sounding of burgular alarms, construction and demolition equipment which characteristically emit sound but which may be fitted and accommodated with equipment such as enclosures to suppress sound or may be operated in a manner so as to suppress sound, suppressable and preventable industrial and commercial sources of sound, and other man-made sounds that cause noise.

10.3 Regulation 10.1 shall not apply to sounds emitted during and associated with

(a) parades, public gatherings, or sporting events, for which permits have been issued provided that said parades, public gatherings, or sporting events in one city or town do not cause noise in another city or town;
(b) emergency police, fire, and ambulance vehicles:
(c) police, fire, and civil and national defense activities; and
(d) domestic equipment such as lawn mowers and power saws between the hours of 7 A.M. and 9 P.M.

10.4 Regulation 10.1 is subject to the enforcement provisions specified in Regulation 52.1.

(EXCERPTS)

THE CITY OF BOSTON

BOSTON AIR POLLUTION CONTROL COMMISSION

ROOM 911
1 CITY HALL SQUARE
BOSTON, MASSACHUSETTS 02201

REGULATIONS

FOR

THE CONTROL OF

ATMOSPHERIC POLLUTION

Adopted under the provisions of
Section 31C, Chapter 111, General Laws

REGULATION 1. GENERAL PROHIBITION OF EMISSIONS

No person or persons owning, leasing, or controlling the operation of any air contamination source or sources shall willfully, negligently, or through failure to provide necessary equipment or facilities or to take necessary precautions, permit the emission from said air contaminant source or sources of such quantities of air contaminants which will cause a condition of atmospheric pollution.

CITY OF BOSTON
AIR POLLUTION CONTROL COMMISSION
Room 911, Boston City Hall

Eugenie Beal
Acting Executive Director

722-4300
ext. 207

(EXCERPTS)

REGULATIONS FOR THE CONTROL OF NOISE

IN THE CITY OF BOSTON

Definitions	
Regulation 1.	General Prohibition of Noise Emissions
Regulation 2.	Restrictions - Zoning Districts
Regulation 3.	Restrictions - Construction Sites
Regulation 4.	Restrictions - New Vehicles
Regulation 5.	Restrictions - New Outdoor Powered Equipment
Regulation 6.	Permits
Regulation X.	Conflict with Other Regulations
Regulation Y.	Variances
Regulation Z.	Severability

The Air Pollution Control Commission of the City of Boston, acting under the authority granted in Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts, and by the City of Boston Code, Ordinances, Title 7, Section 50, hereby adopts the following Regulations for the Control of Noise in the City of Boston.

REGULATIONS FOR THE CONTROL OF NOISE
IN THE CITY OF BOSTON

REGULATION 1: General Prohibition of Noise Emissions

No person or persons owning, leasing, or controlling the operation of any source or sources of noise shall willfully, negligently, or through failure to provide necessary equipment or facilities or to take necessary precautions, permit the establishment of a condition of noise pollution.

REGULATION 2: Noise Restrictions According to Zoning Districts

2.1 This Regulation shall apply to the use or occupancy of any lot or structure thereon and to the noise produced thereby, but shall not apply to the following:

a) The intermittent or occasional use, during the daytime, of homeowner's light residential outdoor equipment or commercial service equipment, provided said equipment and its use complies with other provisions of these Regulations;

b) Construction activities and the associated use of construction devices nor to the noise produced thereby, provided such activities, and such equipment and its use complies with other provisions of these Regulations;

c) The operation of any motor vehicle on any public way, nor to the noise produced thereby.

2.2 Noise in Residential Zoning Districts or Affecting Residential or Institutional Property

No person shall create or cause to be emitted from or by any source subject to Regulation 2, any noise which causes or results in a maximum noise level, measured at any lot line of any lot located in any Residential Zoning District or in residential or institutional use elsewhere in compliance with the Boston Zoning Code, in excess of any level of the "Residential District Noise Standard", Regulation 2.5; provided that if said lot is located in any Industrial Zoning District, the maximum noise level, measured at the lot line, shall not exceed any level of the "Residential-Industrial Noise Standard", Regulation 2.5.

2.3 Noise in Business Zoning Districts

No person shall create or cause to be emitted from any source subject to Regulation 2, any noise which causes or results in a maximum noise level, measured at any lot line of any lot in any Business Zoning District other than a lot in residential or institutional use in conformance with the Boston Zoning Code, in excess of any level of the "Business District Noise Standard", Regulation 2.5.

2.4 Noise in Industrial Zoning Districts

No person shall create or cause to be emitted from or by any source subject to Regulation 2, any noise which causes or results in a maximum noise level, measured at any lot line of any lot in recreational or business use in any Industrial Zoning District in conformance with the Boston Zoning Code, in excess of any level of the "Industrial District Noise Standard", Regulation 2.5.

2.5 Zoning District Noise Standards

Noise standards referred to in these Regulations for the several zoning districts of the City of Boston, as defined in and established persuant to the Boston Zoning Code, are as established by the following table:

TABLE OF ZONING DISTRICT NOISE STANDARDS

Maximum Allowable Octave Band Sound Pressure Levels

Octave Band Center Frequency Of Measurement (Hz)	Residential		Residential - Industrial		Business	Industrial
	Daytime	All Other Times	Daytime	All Other Times	Anytime	Anytime
31.5	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
Single Number Equivalent	60 dBA	50 dBA	65 dBA	55 dBA	65 dBA	70 dBA

REGULATION 3: Restrictions on Noise Emitted from Construction Sites

3.1 Except as provided for in Regulation 3.3 and 3.4, it shall be unlawful for any person to operate any construction device or devices on any construction site if the operation of such device or devices emits noise, measured at the lot line of the affected property, in excess of the values shown below:

Lot Use of Affected Property	L_{10} level	Maximum Noise Level
Residential or Institutional	75 dBA	86 dBA
Business or Recreational	80 dBA	--
Industrial	85 dBA	--

The same level shall apply to any public way as applies to an industrial use. Measurements should not be taken closer than fifteen (15) meters (50 feet) from the nearest active construction device on the construction site. The maximum noise level shall be measured on the sound level meter on "Slow" response.

3.2 The L_{10} level shall be determined in the following manner:

a) Every ten seconds, on the mark, the A-weighted noise level on the sound level meter on "slow" response is recorded until one hundred (100) observations have been made. If, during any of these observations, a measurement is substantially affected by any source outside the construction site (such as an aircraft overflight), measurements made during these periods will not be considered. However, the observation period shall be extended until 100 valid measurements are obtained. The L_{10} level will be that level that is equal to the tenth highest level recorded.

b) If, in the estimation of the person taking the measurements, outside noise sources contribute significantly to the noise level, the above procedure shall be repeated (with the same outside noise source contributions) when construction is inactive, in order to determine the existing background L_{10} level. The L_{10} level during construction must exceed the background L_{10} level by five (5) dBA to be considered a violation of Regulation 3.1

3.3 Except as provided for in Regulation 3.4, it shall be unlawful to operate a construction device at any street excavation, grading or repair, utility street work installation or repair, which produces a noise level exceeding 86 dBA at a distance of fifteen meters (50 feet) from the device.

The provisions of Regulation 3.1 shall not apply to any construction site covered by Regulation 3.3. The provisions of Regulation 3.3 will not be applicable to any construction device used in emergency service work that is necessary to return utility service to an area, provided that within 24 hours such device is brought into compliance with Regulation 3.3, or is not reused within the City until it does comply.

3.4 The provisions of Regulations 3.1 and 3.3 shall not be applicable to impact devices.

APPENDIX W

APPENDIX A
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

ENVIRONMENTAL NOTIFICATION FORM

EOEA # __________
TOWN __________
(For Official Use Only)

I. SUMMARY

A. Project Identification

1. Project Name Lafayette Place
2. Project Proponent Boston Redevelopment Authority and Sefrius Corp & Mondev International

B. Project Description : City/Town(s) Boston
Regional Planning Agency MAPC
1. Location within city/town or street address Washington and Bedford Streets (Central Business District)
2. Est. Commencement Date Late 1978 -early 1980 Est. Completion Date Late 1982
Approx. Cost $ 71,800,000 Current Status of Project Design : 15 % Complete

C. NARRATIVE SUMMARY OF PROJECT (If necessary, use back of this page to complete summary)

Include verbal description of project boundaries and present use of the project area. The proposed Lafayette Place development project epresents a $72 million public and private investment program in the center of owntown Boston and encompasses a major retail/hotel complex, a new City garage, nd ancilliary public improvements. The project area, extending generally from ashington Street to Chauncy and Essex Streets and from Avon Street to Hayward lace and Exeter Place, contains approximately 6 acres of predominantly vacant roperty. The project will continue the renewal activities recently initiated y the reconstruction and consolidation of the Jordan Marsh department store. Under urrent plans, approximately 1,000,000 sq.ft. of space is proposed to be developed. he program's goal is to rejuvenate the retail area along Washington Street and oster round-the-clock activity in the core of downtown Boston. Key components f the Lafayette Place project include:

. A 300,000 square feet retail center along Washington Street, containing specialty shops, boutiques, and theatres.
. A 500-room, high-quality hotel tower 42 stories high to be built behind the retail center.
. A total of 1500 parking spaces will be provided by the City of Boston in a multi-level underground garage built beneath the retail/commercial/hotel complex and in either a renovated Hayward Place garage or in an expansion of the underground garage beneath the site of the Hayward Place Garage.
. Construction of a new east-west arterial street to facilitate the movement of vehicles to and from the project area and to provide access to the garage.
. Related project and other street improvements, including plaza construction, landscaping, street improvements, and sidewalk widenings to create a pleasant pedestrian environment.

Further information may be obtained from:

Name: Richard Mertens Firm/Agency Boston Redevelopment Authority

Address: Boston City Hall, One City Hall Sq. Boston, MA 02201 Phone No. 722-4300

USE THIS PAGE TO COMPLETE NARRATIVE, if necessary. The Lafayette Place developmen site is located in the commercial core of downtown Boston, one block from the 100% retail corner at Washington and Summer Streets. The office buildings at Government Center and the Financial District are a few blocks to the north and northeast The South Station area to the east is being redeveloped as a major transportation center with concurrent office and commercial development. Retail activity borders the project area on the north, west, and south, ranging from major department stores to the small stores and specialty shops near Tremont Street to the bookstores, nightclubs, and lounges in the City's adult entertainment zone. Chinatown's commercial and entertainment area, and a small garment industry district, lie to the southeast.

Although now underutilized, the project area has been a high density commercial area, with retail activity, wholesaling, and light manufacturing the predominant uses. Today, the 6 acre site is largely occupied by surface parking lots and garages, and vacant commercial buildings. In general, the area surrounding the project site is intensely built up, with moderately high density. Buildings vary from recently-constructed office and retail facilities, to late 19th century mercantile buildings, many of which have deteriorated and are badly maintained. The project site is easily accessible by public transportation and auto.

D. SCOPING

1. Check those areas which would be important to examine in the event that an EIR is required for this project. This information is important so that significant areas of concern can be identified as early as possible, in order to expedite analysis and review.

	Construction Impacts	Long Term Impacts		Construction Impacts	Long Term Impacts
OPEN SPACE & RECREATION			AGRICULTURAL LANDS		
HISTORICAL	X	X	MINERAL RESOURCES		
ARCHAEOLOGICAL			ENERGY USE	X	X
FISHERIES & WILDLIFE			WATER SUPPLY		X
VEGETATION, TREES			WATER POLLUTION		
OTHER BIOLOGICAL SYSTEMS			AIR POLLUTION	X	X
INLAND WETLANDS			NOISE	X	X
COASTAL WETLANDS OR BEACHES			SOLID WASTE	X	X
FLOOD HAZARD AREAS			AESTHETICS		X
CHEMICALS, HAZARDOUS SUBSTANCES, HIGH RISK OPERATIONS			GROWTH IMPACTS		
GEOLOGICALLY UNSTABLE AREAS			COMMUNITY/HOUSING AND THE BUILT ENVIRONMENT	X	X
			OTHER (Specify) Traffic Circulation, Parking, and Pedestrian Circulation	X	X

2. List the alternatives which you would consider to be feasible (in the event an EIR is required).

No Project
Alternative Scales of Development
Alternative Redevelopment proposals (uses)

E. Has this project been filed with EOEA before? YES _____ NO X
If YES, EOEA #. ________ EOEA Action? ________

F. Does this project fall under the jurisdiction of NEPA? YES X NO _____
If YES, which Federal Agency HUD NEPA Status? EIS in preparation

G. List the Municipal, State or Federal agencies from which permits will be sought:

Comm. of Mass.-Water Pollution Control	Sewer Connection Permit
Housing and Urban Development	Urban Renewal Plan approval
Boston Redevelopment Authority	Ch. 121A approval
Boston Public Improvements Comm.	Approval of street changes
Boston Building Department	Building Permit
Boston Redevelopment Authority	Land Disposition Agreement

H. List the agencies from which the proponent will seek financial assistance for this project :

AGENCY NAME	FUNDING AMOUNT
City of Boston	$30,004,000±

II. PROJECT DESCRIPTION

A. Include an original 8½x11 inch or larger section of a U.S.G.S. 1:24,000 scale topographic map with the project area location and boundaries clearly shown. Include multiple maps if necessary for large projects. Include other maps, diagrams or aerial photos if the project cannot be clearly shown at U.S.G.S. scale. If available, attach a plan sketch of the proposed project.

B. State total area of project : 6 acres
Estimate the number of acres affected that are currently (to nearest 1/10 acre):
1. Developed 6 acres
2. Open Space 0 acres
3. Wetlands 0 acres
4. Floodplain 0 acres
5. Coastal Area 0 acres
6. Productive Resources
-Agriculture 0 acres
-Forestry 0 acres
-Mineral Products 0 acres

C. Provide the following dimensions, if applicable :
Length in miles _____
Number of Housing Units _____
Number of Stories 3-37

	EXISTING	FUTURE
Number of Parking Spaces	982	1,500
Vehicle Trips generated or counted per day	9,900	13,300
	(one-way trips)	

D. If the proposed project will require any permit for access to local or state highways, please attach a sketch showing the location of the proposed driveway(s) in relation to the highway and to the general development plan; identifying all local and state highways abutting the development site; and indicating the number of lanes, pavement width, median strips and adjacent driveways on each abutting highway.

See attached site plan for proposed street changes.

III. ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

Instructions : Consider direct and indirect impacts, including those arising from general construction and operations. In all cases, explain why significant impact is considered likely or unlikely to result. Also, state the source of information or other basis for the answers supplied.

A. OPEN SPACE AND RECREATION

1. Might the project affect the condition, use or access to any open space and/or recreation area? YES _____ NO X

Explanation and Source :

No open space or recreation area is located within or in the immediate vicinity of the project area (field observation)

B. HISTORIC RESOURCES

1. Might any site or structure of historic significance be affected by the project? YES _____ NO X

Explanation and Source : The project site is adjacent to two eligible National Register districts - the Washington Street Theatre District and the Commercial Palace District. The proposed development has been reviewed with both the Massachusetts Historical Commission and the Boston Landmarks Commission, who have concurred that the project should not have an adverse impact on these historic properties.

2. Might any archaeological site be affected by the project? YES _____ NO X
Explanation and Source :

The project involves development in the built-up, previously disturbed downtown area. Although no archaeological sites are expected to be impacted, there is the potential that ancient Indian artifacts could be encountered if excavation reaches certain levels (State Archaeologist).

C. ECOLOGICAL EFFECTS

1. Might the project affect fisheries or wildlife, especially any rare or endangered species? YES _____ NO X
Explanation and Source :

The project site is a long-developed urban area and does not contain any fisheries or wildlife resources (field observation)

2. Might the project affect vegetation, especially any rare or endangered species of plant? YES ______ NO X

Explanation and Source : (Estimate approximate number of mature trees to be removed).

The project site is a long-developed urban area and does not contain any vegetation resources (field observation).

3. Might the project involve alteration of flood hazard areas, inland or coastal wetlands, estuaries, marshes, sand dunes and beaches, ponds, streams, rivers, fish runs, shellfish beds, etc.? YES ______ NO X

Explanation and Source : The project site is an inland site and is not located within a flood hazard zone, wetland, marshland, beach area, etc., nor are any of the above features located in or adjacent to the project area (field observation, HUD Flood Insurance Maps for Boston, MA, Community No. 250286, No. H01-38, dated November 22, 1974).

D. ENVIRONMENTAL HAZARDS

1. Might the project involve the use, transportation, storage, release, or disposal of potentially hazardous substances? YES ______ NO X

Explanation and Source :

No hazardous substances are programmed to be utilized in this project (development proposal).

2. Might the project affect shoreline erosion or accretion at the project site, downstream or in nearby coastal areas? YES ______ NO X

Explanation and Source :

The project area is not located near any shoreline or coastal area (field observation)

3. Might the project involve other geologically unstable areas? YES ____ NO X

Explanation and Source :

The project area is located on the original hills of the Boston Peninsula and does not include any unstable areas. (boring data, Haley & Aldrich, Eng.)

E. RESOURCE CONSERVATION AND USE

1. Might the project affect or eliminate land suitable for agricultural or forestry production? YES ________ NO X

Explanation and Source : (describe any present agricultural land use and farm units affected)

The project area is a long-developed urban area and does not contain any land suitable for agricultural or forestry production (field observation)

2. Might the project affect the potential use or extraction of mineral or energy resources (e.g., oil, coal, sand & gravel, ores)? YES ____ NO X

Explanation and Source :

The project site is a long-developed urban area and is not suitable for the extraction of mineral or energy resources (field observation)

3. Describe as well as possible at this time any new or modified energy consumption resulting from the project. If applicable, describe plans for conserving energy resources.

Based on the assumption that heating and air conditioning would be supplied by Edison steam, it is estimated that steam demand of the project would be 33,000 lbs/hr. and maximum electrical demand would be 2050 KW. More than adequate supply is available in the Edison system to serve this demand. Design of the project will incorporate energy conservation measures required by Article 22 of the State Building Code (Boston Edison Co.)

F. WATER QUALITY AND QUANTITY

1. Might the project result in the introduction of pollutants into any of the following :

(a). Marine Waters............................YES X NO ____
(b). Surface Fresh Water Body.............YES ____ NO X
(c). Ground Water...........................YES ____ NO X

Explanation and Source : (state the present water quality classification of the receiving surface water)

There are no marine or surface fresh water bodies located in the project area, and no evidence of excessively high ground water or high water table in the area. Drainage from the site will be discharged into the City's sewer system (boring data, Haley and Aldrich, Eng.)

2. Might the project result in an increase in paved or impervious surface over an aquifer or aquifer recharge area? YES ____ NO X

Explanation and Source :

The project site is not located over any known aquifer or aquifer recharge area. The project will not result in any increase in paved area over the existing (U.S.G.S.)

3. Is the project in the watershed of any surface water body used as a drinking water supply? YES ________ NO X

Are there any PUBLIC or PRIVATE wells within a ½-mile radius of the proposed project? YES ________ NO X

Explanation and Source : Drinking water to the City of Boston is supplied by the MDC system, the principal source of which is the Quabbin Reservoir in Central Massachusetts (MDC, U.S.G.S.)

4. Estimated Water supply needs of project : approx. 394,765 gallons per day
Indicate water supply source MDC system

5. Does the project involve dredging? YES ________ NO X

Explanation and Source : (describe the estimated quantity and quality of any dredged material, proposed dredging method & proposed disposal site (s).)

The project will involve the excavation of approximately 136,670 cubic yards of material for the construction of the underground garage. Disposition is as yet undetermined, but may include filling of future development sites and/or disposal at an approved landfill site (development proposal, BRA Engineering Department)

G. AIR QUALITY

1. Might the project affect the air quality in the project area or the immediately adjacent area? YES X NO ________

Explanation and Source : (describe type and source of any pollution emission from the project site) Site clearance, excavation and construction activities will result in a temporary increase in particulate levels from the site. During project operation, major pollutants will be CO, HC and NO_x from the garages, site-generated vehicular traffic and exhaust fumes. Plans for heating the project still are being developed, but do not currently call for on-site burning of fuel.

2. Are there any sensitive receptors (e.g. hospitals, schools, residential areas) which would be affected by any pollution emissions caused by the project?
YES X NO ________

Explanation and Source :

Residential structures located in the vicinity of the project area include the Chauncy Street Housing, Mason Place elderly project (proposed) and Tremont-on-the-Common. In addition, Washington Street is a major pedestrian path (field observation).

H. NOISE

1. Might the project result in the generation of noise? YES X NO ____

Explanation and Source : Construction of the project and subsequent operation has the potential for noise generation. Construction period noise will result from site clearance, excavation, and construction, including possible pile driving. During the operational phase, potential noise sources will include traffic and building mechanical equipment (development proposal)

2. Are there any sensitive receptors (e.g. hospitals, schools, residential areas) which would be affected by any noise caused by the project?
YES X NO ____

Explanation and Source : Residential structures located in the vicinity of the project include the Chauncy Street Housing, Mason Place elderly project (proposed) and Tremont-on-the-Common. In addition, Washington Street is a major pedestrian path. Noise generating equipment will be enclosed or otherwise designed to meet present noise standards at the property line (field observation)

I. SOLID WASTE

1. Might the project generate solid waste? YES X NO ____
Explanation and Source : (estimate types and approximate amounts of waste materials generated, e.g., industrial, domestic, hospital, sewage sludge, construction debris.)

Construction period debris from site clearance, excavation and construction is estimated at 146,080 cu.yds. (216,585 tons). Solid waste from project operation is estimated at 14.5 tons per day. Sanitary sewage is estimated at 384,765 gal. per day. (BRA Engineering Dept., Charlestown Navy Yard EIR).

J. AESTHETICS

1. Might the project cause a change in the visual character of the project area or its environs? YES X NO ____

Explanation and Source : The project should improve the visual character of the project area by replacing existing unattractive open parking lots with a modern retail and hotel complex (development proposal)

2. Might the project impair visual access to waterfront or other scenic areas?
YES ____ NO X

Explanation and Source : The project area does not contain any scenic areas and does not have any visual access to the waterfront (field observation).

K. WIND AND SHADOW

1. Might the project cause wind and shadow impacts on adjacent properties?
YES X

Explanation and Source : The project will not result in any adverse shadow impacts on adjacent properties or public open spaces. The project may cause wind impacts from the hotel tower. City policy is to require wind tests for all new high-rise buildings (BRA Urban Design Dept.)

L. PLANNING

1. Will the project comply with current Federal, state, and local land use, transportation, open space, recreation and environmental plans and policies? YES X NO ______

Explanation and Source :

The proposed Lafayette Place development is in conformity with the 1965-1975 General Plan for the City of Boston and the Regional Core, adopted by the BRA in March of 1965. It is also in conformity with the overall objectives and basic proposals of the Downtown General Neighborhood Renewal Plan Area (Mass R-46) and with both the Central Business District Urban Renewal Plan and the Bedford-West Urban Renewal Plan. By creating new retail and commercial development, the project follows previously established principles for downtown development (documents cited)

Extent of Proponent Participation:

1. City of Boston-to construct 1500 parkkng spaces, New Essex Street, public ways. 2. Boston Redevelopment Authority - to convey urban renewal land to City. 3. Lafayette Place Associates - to construct hotel and retail complex.

FINDINGS AND CERTIFICATION

A. This project is one which is categorically included and therefore requires an Environmental Impact Report. YES ____ NO X

B. This project is neither categorically included nor excluded. YES X NO ____

C. I hereby certify that this form has been circulated to the Attorney General, the appropriate Regional Planning Agency, and other agencies as required by Appendix B, and that notice of intent to file the form has been published as required by section 14.2 of the regulations.

JUL 12 1978

DATE

Signature of Responsible Agency Officer or Project Proponent

Robert F. Walsh

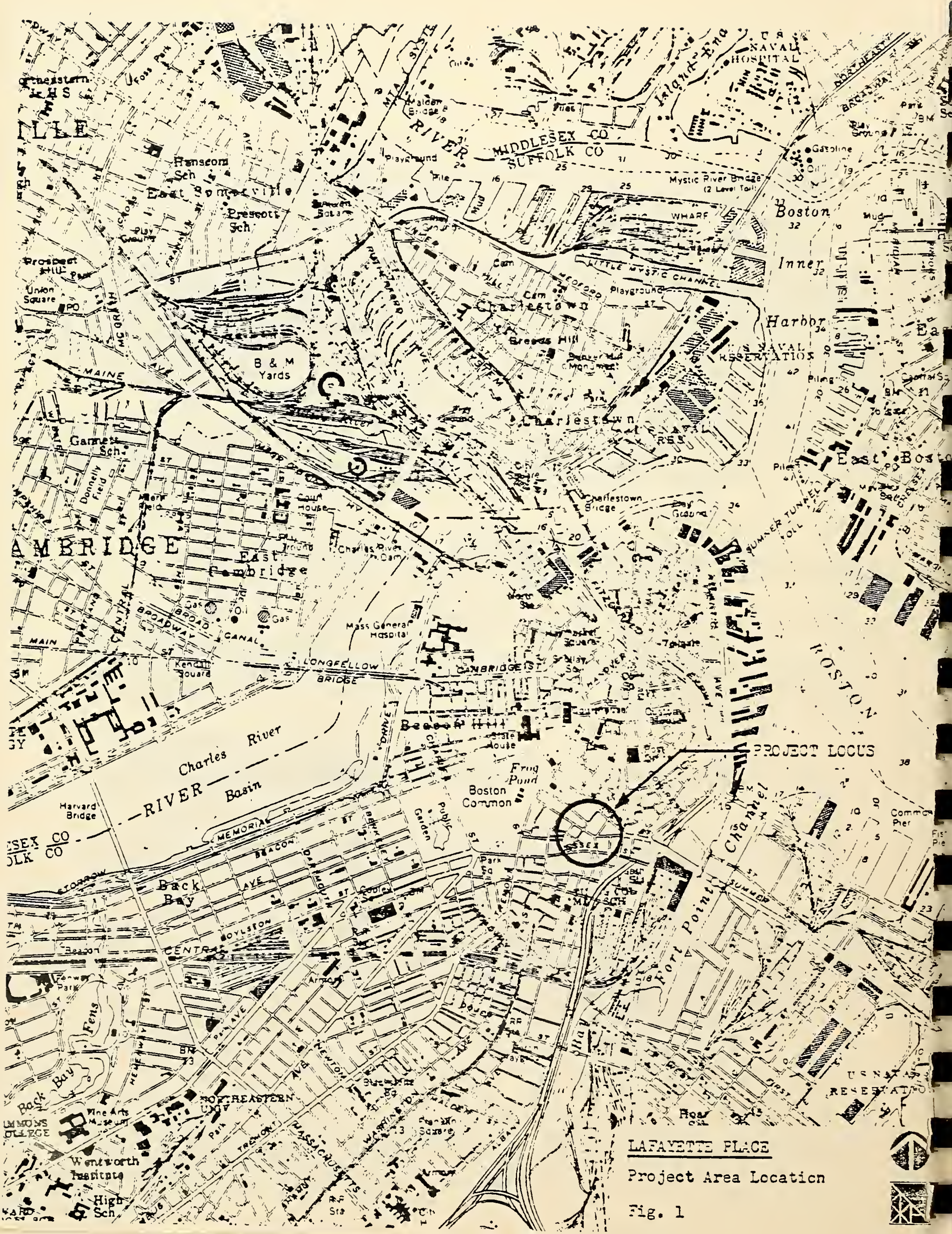
(print or type)

Name of Responsible Officer

Signature of Preparing Officer
(if different from Responsible Officer)

Boston Redevelopment Authority
Address Boston City Hall
One City Hall Square
Boston, MA 02201

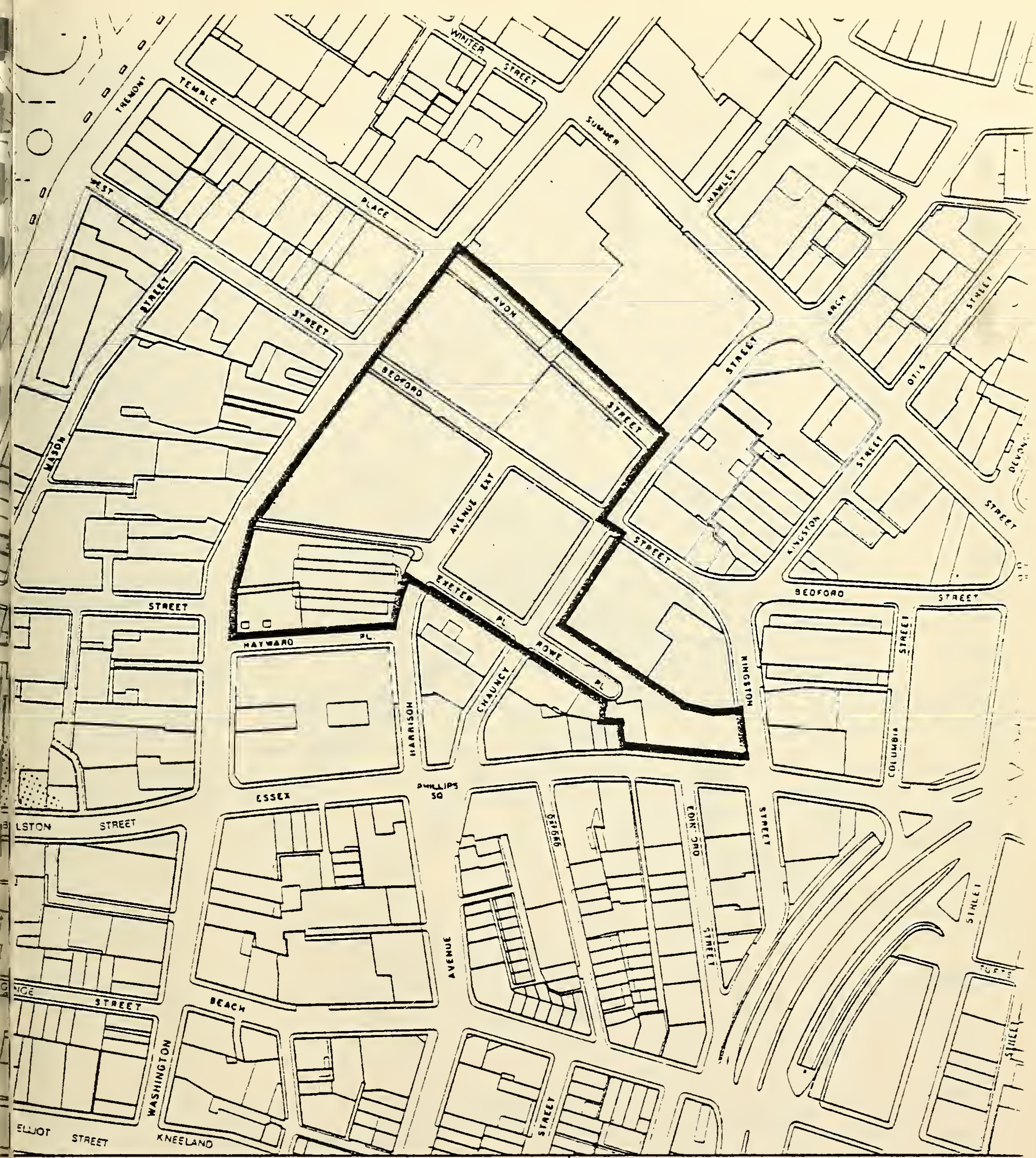
Telephone No. 722-4300



LAFAYETTE PLACE

Project Area Location

Fig. 1

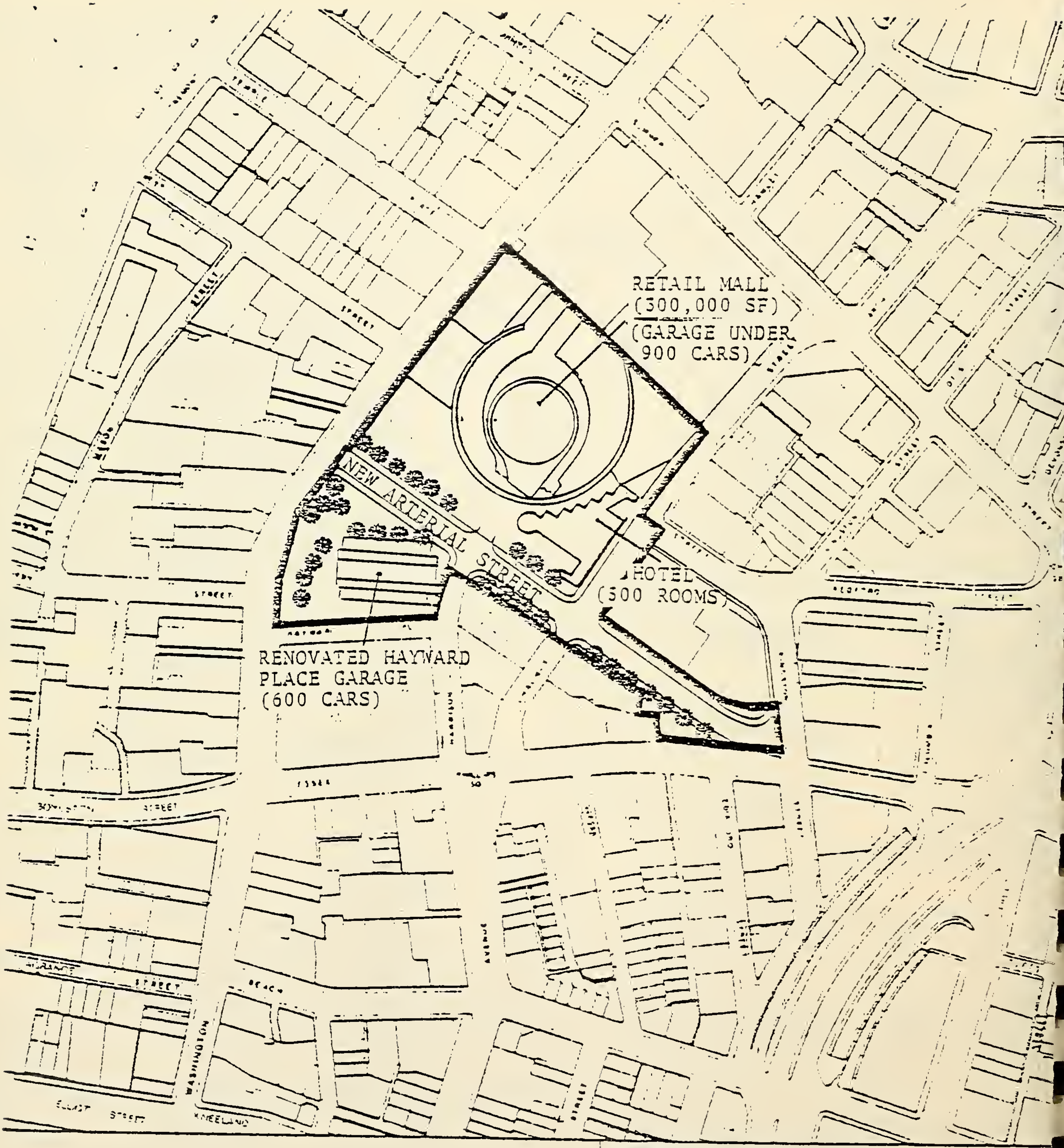


LAFAYETTE PLACE

PROJECT AREA BOUNDARIES

Fig. 2

BOSTON REDEVELOPMENT AUTHORITY

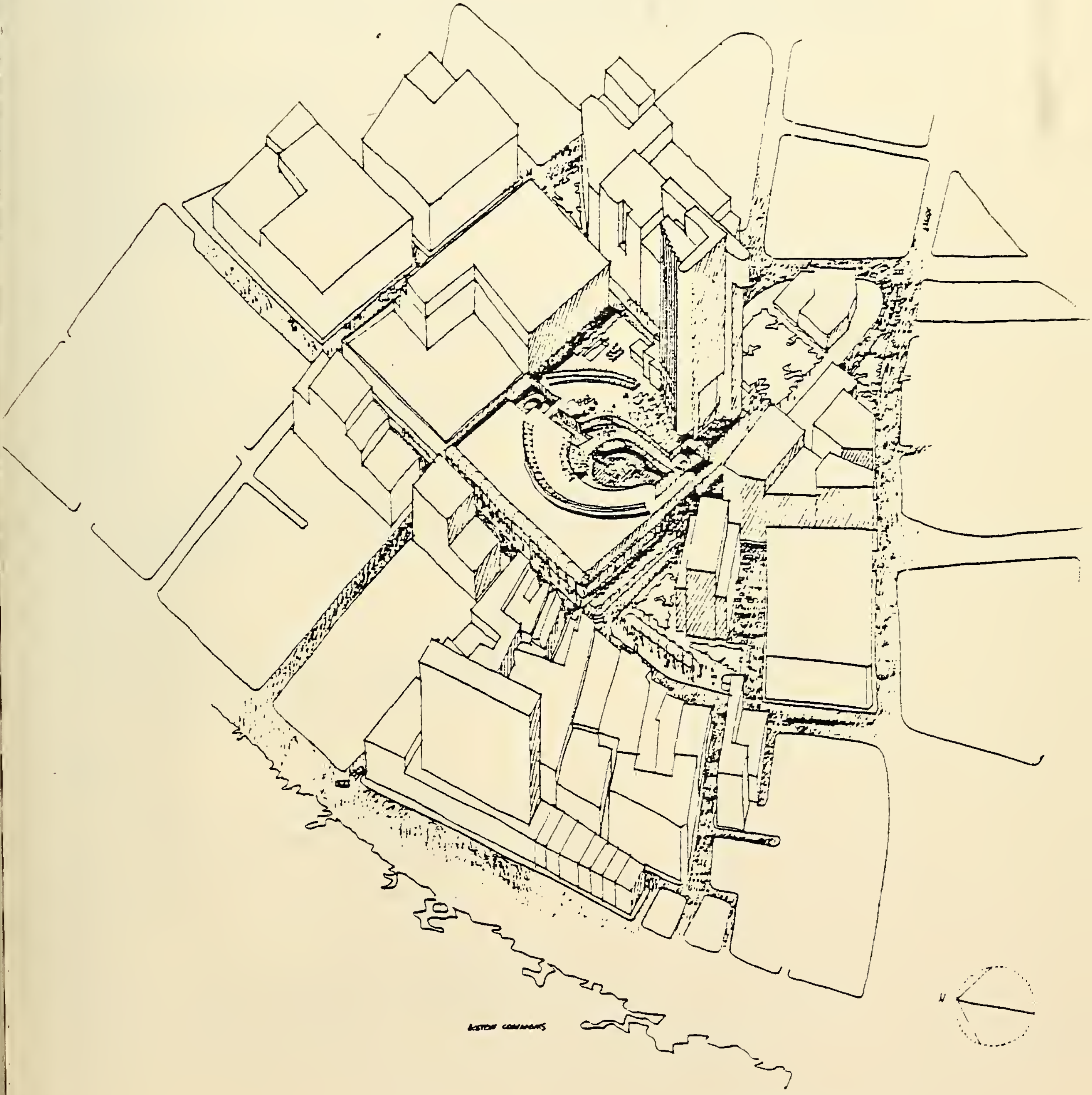


LAFAYETTE PLACE

PROPOSED SITE PLAN

Figure 3

BOSTON REDEVELOPMENT AUTHORITY



LAFAYETTE PLACE

Perspective View of Project

Fig. 4

ACKNOWLEDGEMENTS

This Environmental Impact Statement was prepared by the Environmental Review Section of the Boston Redevelopment Authority with the assistance of the following departments of the Authority:

Community Development
Downtown Development
Engineering
Planning
Preservation Planning
Research
Transportation Planning
Urban Design
Word Processing

Consultant services for this Statement were provided by the following:

City of Boston Air Pollution Control Commission (noise level monitoring and analyses)

Parsons Brinckerhoff Quade & Douglas, Inc. (air quality monitoring study)

Bolt Beranek and Newman, Inc. (air quality impact analysis)

The following agencies and groups were consulted in the preparation of this Statement:

Federal

Department of Housing and Urban Development, Boston Area Office
Environmental Protection Agency, Region I
    Air and Hazardous Materials Division
    Noise Program Branch

State

Department of Environmental Quality Engineering
    Division of Air and Hazardous Materials
    Bureau of Solid Waste Disposal
State Archaeologist
Massachusetts Historical Commission

Local

Boston Air Pollution Control Commission
Boston Fire Department
Boston Landmarks Commission
Boston Police Department
Boston Public Works Department

Private

Boston Edison Company
New England Telephone Company
I.M. Pei and Partners
SEFRIUS Corp.

Richard B. Mertens, Environmental Review Officer, BRA
Joseph J. Berlandi, Director of Downtown Development, BRA
James J. Derba, Jr., Lafayette Place Project Coordinator, BRA

City of Boston

Kevin H. White, Mayor

Boston Redevelopment Authority

Robert L. Farrell, Chairman
Joseph J. Walsh, Vice-Chairman
James G. Colbert, Treasurer
James K. Flaherty, Assistant Treasurer
James E. Cofield, Member

Kane Simonian, Secretary
Robert F. Walsh, Director

Downtown
B65R
1978

AUTHOR
Lafayette Place
TITLE

DATE LOANED	BORROWER'S NAME

BOSTON
PUBLIC
LIBRARY